JonesEdmunds

MARION COUNTY
BASELINE LANDFILL EXPANSION – CONCEPTUAL DESIGN OPTIONS
SUMMARY REPORT

Marion County | August 2024

MARION COUNTY BASELINE LANDFILL EXPANSION
CONCEPTUAL DESIGN OPTIONS
SUMMARY REPORT

Prepared for:

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EXECUTIVE SUMMARY

The Marion County Solid Waste Department (SWD) is responsible for managing residential municipal solid waste (MSW) in unincorporated Marion County. Historically, this waste was disposed of at the Marion County Baseline Landfill; however, in 2019 the County began hauling MSW to the Heart of Florida (HOF) Landfill in Sumter County, Florida. The HOF Landfill airspace that SWD purchased is projected to be consumed by Fiscal Year 2031. With this date fast approaching, Marion County will need options to meet their future waste disposal needs. This report provides a financial comparison of two possible solid waste management options: expansion of Baseline Landfill versus continued out-of-County disposal.

Jones Edmunds prepared conceptual designs of several landfill expansion cells on the Baseline Landfill property and on other adjacent properties. Six conceptual phases for future landfill expansion were evaluated, including three on-site phases and three off-site phases. The capacity, added lifespan, costs, and infrastructure relocation requirements for each of the conceptual landfill expansions were then estimated.

The estimated lifespan of each cell was determined using an assumed annual solid waste tonnage growth rate of 1.56 percent. The cost of expanding on the Baseline Landfill property and adjacent property was then compared to the cost of transporting waste to the HOF Landfill.

Table ES-1 summarizes the capacity, lifespan, and costs for the Baseline Landfill expansion. This table also presents the estimated cost for out-of-County disposal at the HOF Landfill if the Baseline Landfill is not expanded. Costs are presented as a cost-per-ton and as a total cost for the associated expansion phase.

Table ES-1 Cost Comparison: Baseline Landfill Expansion Versus Hauling Out-of-County Disposal

Item[1]	Landfill Expansion (Phases 1 to 6)	Out-of-County Disposal
Capacity (tons)	58,600,000	Not Applicable
Lifespan (years)	109	Not Applicable
Cost/Ton	$23.92	$59.18
Revenue/Ton	$60	$60
Difference/Ton (Revenue minus Cost)	$36.08	$0.82
Total Cost Opinion	$1.4 billion[2]	$3.5 billion[3]
Difference	$2.1 billion	

Notes:
1 All costs are presented in 2024 dollars.
2 Total Expansion Cost Opinion includes landfill construction, infrastructure replacement, operations, property purchase, and closure costs.
3 Out-of-County Disposal Cost Opinion includes waste transportation, offsite disposal, and transfer station operation and maintenance costs.

Similarly, Graphic ES-1 visualizes the conceptual expansion of the Baseline Landfill, with quick details for each phase including Capacity, Lifespan, Total Cost, and Total Revenue.

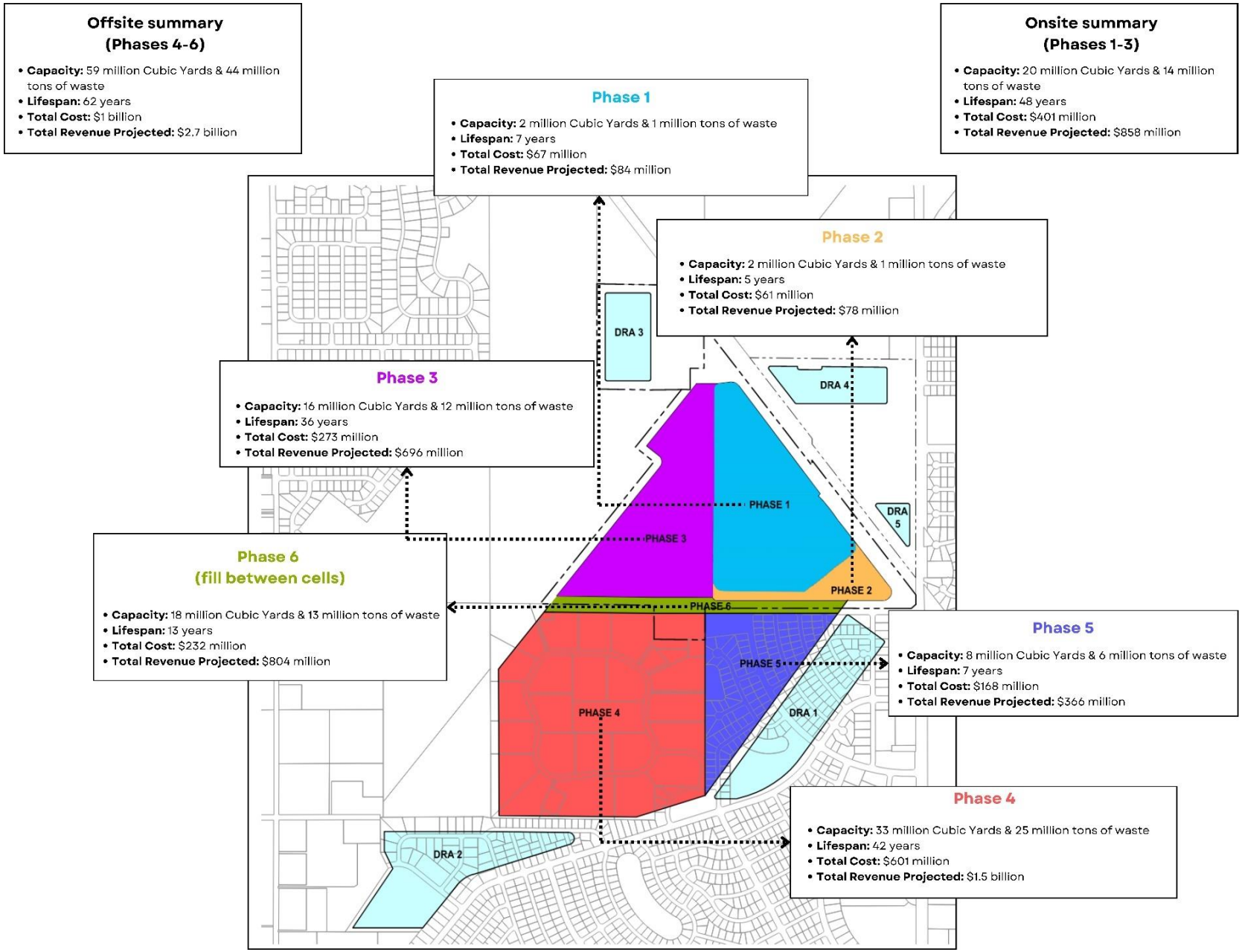
The conceptual landfill expansion phases presented in this study are projected over the next 109 years, resulting in estimated total MSW disposal costs that are approximately half of what they would cost if Marion County continued transporting waste out of the County. Graphic ES-2 compares the total out-of-County disposal cost (in orange) and the total expansion cost (in blue) and the difference between the two (in green).

Several significant risks and challenges exist regarding developing new landfill cells at the Baseline Landfill. The Baseline Landfill is in a karst geological setting that is prone to sinkhole activity. When the original lined cells at Baseline were constructed in the 1990s, unique engineering measures were used to minimize sinkhole potential and support landfill bottom-liner systems. These measures included stormwater controls, ground improvement techniques (e.g., compaction grouting), and high-strength geotextiles. The cost of implementing these measures is included in the landfill development costs presented in this report. This approach was accepted by FDEP at the time and has performed as intended.

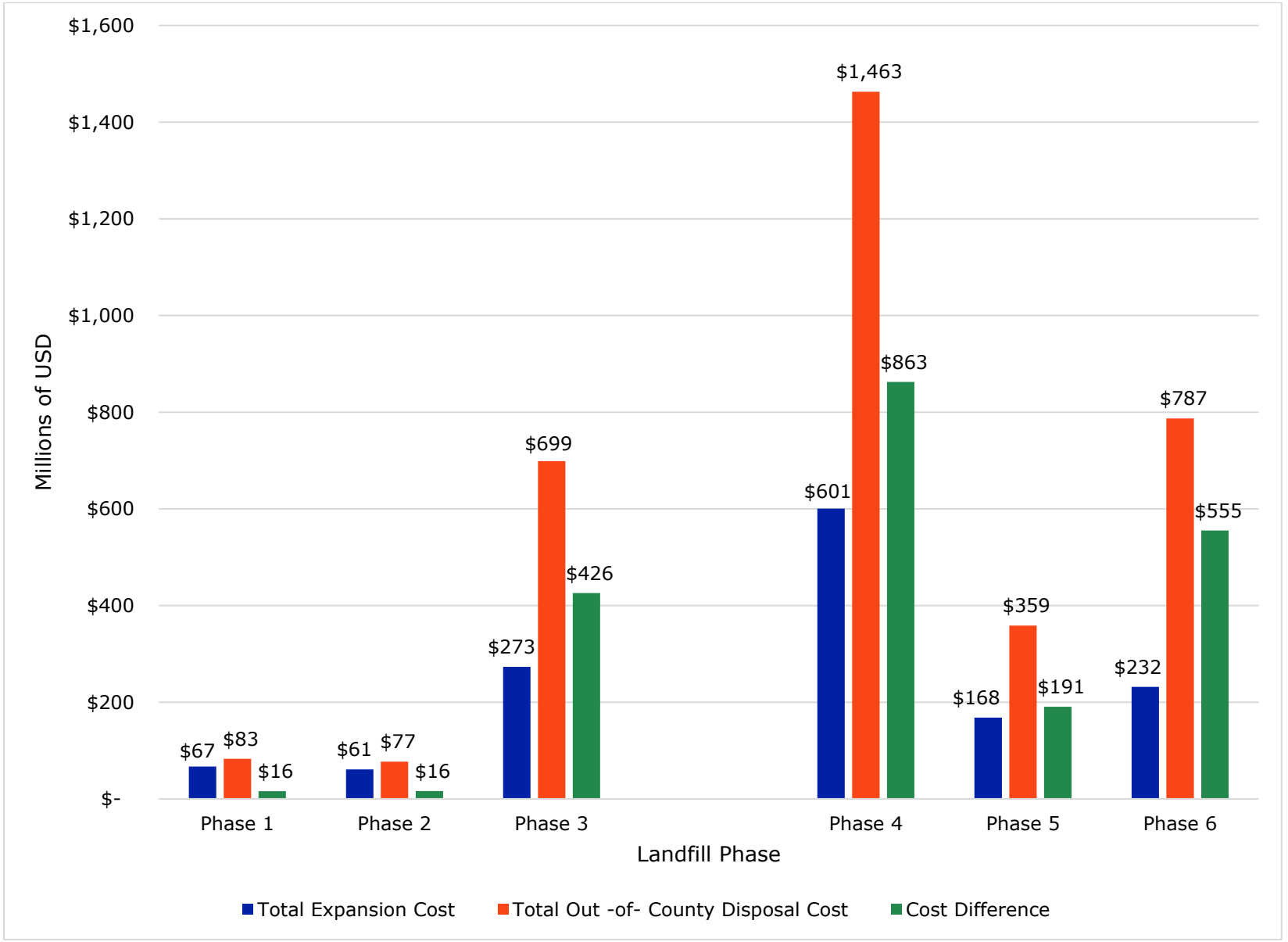
However, the Florida Department of Environmental Protection (FDEP) will again require reasonable assurance that these ground improvement measures will be adequate to support the liner system and will use their own judgment when reviewing applications for landfill construction permits. Therefore, approval of permit applications by regulatory agencies is not guaranteed.

As was the case in the 1990s, the County will need to risk the cost of developing a full landfill construction permit application before FDEP will make its final determination. The estimated cost to develop a full landfill construction permit application is approximately $1.5 to $2 million.

Graphic ES-1 Baseline Landfill Expansion Details



Graphic ES-2 Expansion Costs Compared to Out-of-County Disposal Costs by Landfill Phase



Notes: Total Expansion Cost includes landfill construction, infrastructure relocation, operations, and closure costs.
Out-of-County Disposal Cost includes waste transportation, offsite disposal, and transfer station operation and maintenance costs.

1 INTRODUCTION

The Marion County Board of County Commissioners manages the disposal of residential municipal solid waste (MSW) generated in unincorporated Marion County, residential MSW from some Marion County municipalities, and commercial MSW generated throughout Marion County. The County receives this MSW at its transfer station at the Baseline Landfill near Belleview, Florida, where it is consolidated in open-top semi-tractor-trailers and transported to the Heart of Florida (HOF) Landfill in Sumter County, Florida. The County pre-purchased 2,500,000 tons of landfill airspace at the HOF Landfill in 2011, and an additional 140,000 tons of airspace was purchased in 2020. Marion County expects to have consumed this capacity by Fiscal Year (FY) 2031.

The County also owns a permitted Class I MSW landfill on the Baseline Landfill property that is currently inactive. This landfill was built in multiple phases starting in 1979 and received MSW until 2019 when transfer operations to the HOF Landfill began. Although the Baseline Landfill is currently inactive, it is permitted by the Florida Department of Environmental Protection (FDEP) to receive MSW. The County recently renewed the Landfill Operations Permit with FDEP that is valid until 2034.

The County is considering several alternatives for providing future MSW disposal capacity, concurrently with waste filling at the HOF Landfill or once the HOF Landfill capacity is depleted. These alternatives include purchasing additional capacity at an out-of-County landfill, expanding the disposal capacity of the County's Baseline Landfill, and exploring waste-to-fuel or other alternative waste uses.

The County engaged Jones Edmunds to conceptualize and evaluate several landfill cell configurations that the County is considering to increase the disposal capacity of the Baseline Landfill.

Figure 1 shows the six conceptual landfill expansion phases discussed in this report:

- Phase 1: Reconfigure the current Baseline Landfill footprint to increase capacity.
- Phases 2 and 3: Construct lateral expansions of the current Baseline Landfill footprint on the current landfill property.
- Phases 4 and 5: Construct lateral expansions of the current Baseline Landfill onto adjacent properties south of the landfill property.
- Phase 6: Fill the valley between Phases 1 through 3 and Phases 4 through 5.

Phases 1 through 3 are on-site phases that require no additional property purchase. Phases 4 through 6 are off-site phases that would require property purchases.

In addition to conceptual layouts, this document includes construction costs and schedule estimates as well as our assessment of the capacity and lifespan of each expansion alternative. Appendices A and B provide the calculations associated with the construction costs and lifespan estimates, respectively.

The concepts presented in this study were developed considering MSW landfill regulatory requirements to determine potential landfill airspace configurations for future evaluation. Solid waste regulations were reviewed to identify if potential fatal flaws exist in the

conceptual landfill design. The biggest regulatory hurdle that was identified is the prohibition of development of landfills in unstable/karst geology. However, this same prohibition was in place during the original development of the Baseline Landfill and was overcome by performing detailed hydrogeologic investigations, resulting in extensive foundation improvements. This solution is specifically allowed by FDEP regulations; however, there is no guarantee that it will be approved again.

2 BACKGROUND INFORMATION

2.1 POPULATION AND MUNICIPAL SOLID WASTE QUANTITIES

According to estimates by the University of Florida (UF) Bureau of Economic and Business Research (BEBR), Marion County's population was approximately 400,000 in 2023 and is projected to grow to approximately 526,000 by 2050 (medium-projection series), an annual compounding growth rate of 0.94 percent. However, if the UF BEBR high-projection series is assumed for population growth, the Marion County population would grow to approximately 650,000 by 2050, an annual compounding growth rate of 1.56 percent.

Marion County accepts residential MSW from unincorporated Marion County and incorporated municipalities and commercial MSW generated throughout Marion County. Table 2-1 shows the tonnages of MSW accepted by the County between 2012 and 2023 and disposed of in the Baseline Landfill or transported to the HOF Landfill. Table 2-1 illustrates that waste tonnages increased from approximately 127,000 tons in 2012 to approximately 191,000 tons in 2023.

Table 2-1 Baseline Landfill Historical Tonnage Acceptance

Year	Class I Waste (tons)	Class III Waste (tons)	Total Waste (tons)	Annual Growth Rate (%)
2012	106,293	20,872	127,165	-3.49
2013	104,445	22,986	127,432	0.21
2014	106,827	26,122	132,949	4.33
2015	104,218	26,083	130,300	-1.99
2016	108,768	28,504	137,272	5.35
2017	110,655	38,042	148,697	8.32
2018	109,520	43,115	152,635	2.65
2019	109,346	33,132	142,478	-6.65
2020	120,320	33,177	153,497	7.73
2021	126,946	39,867	166,814	8.68
2022	125,818	50,342	176,186	5.62
2023	126,554	64,405	190,971	8.39

Table 2-2 projects future Marion County MSW tonnages estimated by increasing the County's 2023 MSW inflow of 191,000 tons by its BEBR-projected (medium) growth rate of 0.94 percent, BEBR-projected (high) growth rate of 1.56 percent, and estimated high-growth-rate scenario of 3.5 percent. Although the 0.94- and 1.56-percent rates are estimated using projected population growth, the 3.5-percent tonnage growth rate was based on recent tonnage data and projected by the County; however, it is considered to be excessively high for use in long-term waste projections. Tonnages are projected to 2050. Appendix B includes the lifespan calculations, showing further projections. The waste projections used in the cost estimate are based on the 1.56-percent growth rate and are highlighted in **bold**.

Table 2-2 Baseline Landfill Tonnage Projections

Year	0.94-Percent Growth (tons)	1.56-Percent Growth (tons)	3.5-Percent Growth (tons)
2023	190,971	**190,971**	190,971
2024	192,766	**193,950**	197,655
2025	194,578	**196,976**	204,573
2026	196,407	**200,049**	211,733
2027	198,253	**203,169**	219,144
2028	200,117	**206,339**	226,814
2029	201,998	**209,558**	234,752
2030	203,897	**212,827**	242,969
2031	205,814	**216,147**	251,472
2032	207,748	**219,519**	260,274
2033	209,701	**222,943**	269,384
2034	211,672	**226,421**	278,812
2035	213,662	**229,953**	288,570
2036	215,670	**233,541**	298,670
2037	217,698	**237,184**	309,124
2038	219,744	**240,884**	319,943
2039	221,810	**244,642**	331,141
2040	223,895	**248,458**	342,731
2041	225,999	**252,334**	354,727
2042	228,124	**256,271**	367,142
2043	230,268	**260,268**	379,992
2044	232,432	**264,329**	393,292
2045	234,617	**268,452**	407,057
2046	236,823	**272,640**	421,304
2047	239,049	**276,893**	436,050
2048	241,296	**281,213**	451,311
2049	243,564	**285,600**	467,107
2050	245,854	**290,055**	483,456

2.2 Marion County Baseline Landfill History

The Baseline Landfill is at 5601 SE 66th Street, Ocala, Florida. Figure 2 provides a site plan that identifies disposal areas and processing facilities. Landfilling operations began at the Baseline Landfill in 1979 with the construction of the first disposal cell, known as the Urban Cell, which was named for its operator, Urban Waste Disposal, Inc. The Urban Cell was constructed without a bottom liner or leachate collection system and was closed in 1989. The Cell III expansion of the Baseline Landfill was constructed in three phases, with each phase incorporating bottom liner, leachate collection, and leak detection systems. Cell III-A was constructed and put in service in 1988, Cell III-B was put in service in 1991, and Cell III-C was put in service in 1996 and operated until transfer operations to the HOF Landfill began in 2019.

The landfill is currently inactive but has an active FDEP Operations Permit (No. 0103935-021-SO-01) and 1.4 million tons of remaining capacity, although the landfill must be reconfigured to take advantage of this capacity.

The Baseline Landfill is situated in a karst geological setting, and active sinkholes have occurred on the site throughout its operational history. Engineering measures that have been employed previously at the Baseline Landfill to minimize the risk of sinkholes and support the bottom liner in the event of chimney sinkhole development are discussed in Section 3.1.4 and Appendix C. Although the engineering concepts behind these measures are sound and have been successful at Baseline, obtaining regulatory approval for additional landfill expansions is uncertain.

3 LANDFILL EXPANSION CONCEPTS

3.1 METHODS

3.1.1 CONCEPTUAL EXPANSION CONFIGURATIONS

The concepts for expanding the Baseline Landfill consist of six landfill expansion phases that are grouped into three categories based on regulatory status, local land use entitlements, and availability of properties. Figure 3 shows the relative proximity of the six landfill expansion phases to the existing landfill cells described below:

- The first expansion category is to reconfigure the existing Baseline Landfill cells within their current footprint (Phase 1). This may require the least amount of risk and effort from a regulatory and land use entitlement perspective since new landfill airspace is created without increasing the landfill footprint.
- The second category is to expand the Baseline Landfill footprint on contiguous property that the County owns. The County may need to obtain local zoning approval to expand in this area (Phases 2 and 3).
- The third category is to construct new landfill cells on a property south of the current property line that the County does not currently own (Phases 4, 5, and 6). This will require property acquisition in addition to local zoning approval.

Figures 4 through 15A show these conceptual expansion phases. Figure 15A shows the overall expansion, which includes the Phase 6 valley fill between the on-site and off-site phases. Figures 16 and 17 show conceptual locations of drainage retention areas (DRAs) needed to manage stormwater runoff from the built-out landfill cells.

3.1.2 AIRSPACE DETERMINATION

Figures 4 through 15A depict the grading plans showing the cell bottom elevations and final grades of each landfill phase. The volumes of each landfill expansion phase were estimated by comparing the three-dimensional bottom elevation and final grade surfaces using AutoCAD. The volume of the 2-foot drainage/protective cover soil layer has been subtracted from the total volume of each phase to obtain the net waste volumes. These volumes were converted to tons of landfill airspace capacity using an assumed apparent landfill density of 1,500 pounds of MSW per cubic yard of landfill airspace. Appendix B, Reference 3, provides the historical apparent density measurements of the Baseline Landfill that form the basis for this assumption as reported by Jones Edmunds in the *2017 Capacity and Design Life Calculations*.

The assumed apparent landfill density assumes that a landfill compactor is used as part of landfill operations, which is a requirement of the Baseline Landfill Operations Permit and Operations Plan. A landfill compactor is used to spread, crush, and increase the density of waste at the working face of a landfill. A study[1] of landfill compactors at several sites

[1] United States Army Corps of Engineers, Construction Engineering Research Laboratory. *Sanitary Landfill Compactor Evaluation*. Technical Report N-62. March 1979.

reports case studies in which this equipment increased waste compaction by 11 to 30 percent compared to operations that do not use a compactor, although this study is limited in its scope and does not represent all current equipment. Assuming 20-percent compaction and current tonnage acceptance rates, this increased compaction could provide an airspace value of approximately $9,000 per day; alternatively, by not using a compactor, the County will lose disposal space equal to $9,000 per day. Using a GPS grading system on the compactor will provide a high level of compaction and uniformity that is difficult to obtain by strictly manual operation. During the first year of its operational life, the added value of using a compactor will pay for itself.

3.1.3 Lifespan Determination

The lifespan of each expansion phase was estimated by subtracting the annual projected MSW tonnages provided in Table 2-2 and described in Section 2.1 from the airspace capacities of each phase.

3.1.4 Karst Foundation Upgrades

Much of Marion County and the surrounding region are in a karst geologic setting that, depending on site-specific subsurface conditions, is prone to ground subsidence due to sinkholes. Past subsurface investigations at the Baseline Landfill confirm that the Baseline Landfill property is underlain by karst geology and sinkholes have been reported at the site over the years. Based on the subsurface data collected and analyzed at this site and the historical subsidence that has occurred on the property and surrounding areas, expecting sinkholes to develop in the future is reasonable particularly in areas that have not been remediated.

FDEP regulations (Chapter 62-701.300(1)(a), FAC) prohibit constructing landfills in areas where geological formations or other subsurface features will not provide support for the disposal facility. FDEP regulations also require additional geotechnical investigations in karst areas and provide the opportunity for the applicant to present engineering measures to provide *reasonable assurance* that the subsurface of the site will be adequate to support the disposal facility without affecting the performance of the bottom liner as described below:

> ***Chapter 62-701.410, FAC Hydrogeological and Geotechnical Investigation Requirements***
>
> *(g) If the investigations required above indicate that portions of subsurface below the disposal facility show signs of past sinkhole activity, or are reasonably expected to develop sinkholes or sinkhole activity in the future, additional geotechnical investigations shall be included to further characterize the subsurface below the disposal facility for the purpose of assessing potentially unstable areas and for evaluating the effectiveness and design for any engineering measures proposed for any potentially unstable areas. The investigation shall also include an evaluation of any engineering measures needed to provide* ***reasonable assurance*** *that the subsurface of the site in those areas will be adequate to support the disposal facility without adversely affecting the performance of the liner or leachate collection system.*

The Baseline Landfill's Cell III-B and Cell III-C bottom-liner systems that were constructed in 1992 and 1996, respectively, incorporated engineering features designed to minimize the potential for sinkhole formation and support the bottom-liner system if sinkhole subsidence occurs. These design features included a proof-rolling and robust compaction grouting program to strengthen subsurface soils and placement of two layers of stabilization geofabric above the grouted foundation soils and beneath the liner system, as described in the April 2024 Geohazards Engineering and Geology report titled *Preliminary Analysis of Geotechnical Investigation and Remediation Plan for the Marion County Baseline Landfill Expansion*. These engineering design features provided FDEP with the *reasonable assurance* they needed to issue permits to construct the landfill and have worked well over the past 30 years. One advantage to consider is that *reasonable assurance* can be demonstrated by the successful performance of the existing lined cells at the Baseline Landfill. However, approval of permit applications by regulatory agencies is not guaranteed.

Developing a new landfill cell at the Baseline Landfill will involve significant expenditures to investigate the site, design the landfill cells, design a foundation remediation plan, and prepare a permit application that demonstrates that the engineered foundation is suitable to support the landfill and provide *reasonable assurance* of environmental protection. The design and permitting of a new disposal cell approximately the size of Phase 2 are estimated to cost from $1.5 million to $2 million, including the geotechnical investigation, before FDEP can make a final determination. This was the process used in the 1990s for the original lined Cells III-B and III-C. Since that time, the methods used in geotechnical investigations have advanced considerably and will provide a much more detailed understanding of the geologic features at the Baseline Landfill. In addition, geosynthetic materials have improved greatly and are commonly used as part of foundation stabilization and remediation measures.

Landfill expansion projects are typically controversial, and opposition should be expected from nearby residents, businesses, and/or others potentially impacted by developing new airspace capacity. Opponents to the landfill expansion will have opportunities to challenge regulatory agency permitting and entitlement actions (e.g., FDEP landfill construction and operation permits, water management district permits, and local land use and zoning actions).

3.2 PHASE 1: EXPANSION WITHIN THE EXISTING PERMITTED LANDFILL FOOTPRINT

3.2.1 CONFIGURATION

The Baseline Landfill consists of the closed Urban Cell and the inactive but unclosed Cell III (subcells III-A, III-B, and III-C). Landfilling ceased in the Urban Cell and Cell III in 1989 and 2019, respectively. The landfill grades have settled due to waste decomposition (MSW landfills commonly decrease in thickness by 15 percent or more). This settlement creates an opportunity to gain additional airspace without increasing the permitted height of the landfill.

To recover the airspace within the Urban Cell, the cell would be graded as shown in Figures 4A, 4B, and 4C. The regraded cell would have internal side slopes of 6H:1V that slope inward to a center valley. The external side slopes would match the closure design of

Cell III. The internal and external side slopes would have single geomembrane liner, and the center valley would be lined with a standard double-composite liner system with a leachate collection and leak detection system. This valley would slope to the north tip of the Urban Cell where a leachate collection wet well would be constructed to capture leachate that drains from the liner system. Figures 4A, 4B, and 4C show examples of the concept for the reconfigured Cell III.

The existing Urban Cell was constructed without a bottom-liner system. Therefore, an interface liner, consisting of a single geomembrane bedded over 2 feet of compacted fill and covered by 2 feet of protective soil, must be placed under any new MSW placed in the cell. This requirement and a requirement that the interface liner have a minimum slope of 6H:1V or steeper are established in Rule 62-701.430, FAC.

Since Cell III has an existing bottom liner, reconfiguring the existing cell would primarily consist of regrading the waste to re-establish a 3 horizontal to 1 vertical (3H:1V) side slope and stormwater control terraces and to allow access for landfill operations on a large flat area rather than on steep exterior side slopes. The Baseline Landfill is currently permitted to a maximum elevation of 300 feet National Geodetic Vertical Datum of 1929 (NGVD29), which is the approximate height above sea level and approximately 220 feet above the existing ground surface. Re-grading the landfill slopes would allow more waste to be placed up to the maximum elevation. Based on the current grading of Cell III, the maximum geometric elevation that can be achieved is approximately elevation 250 NGVD29.

After reconfiguring the side slopes for the Urban Cell and Cell III, a partial closure of the final slopes could be constructed. This would provide final cover on most of the external side slopes and reduce landfill operation and maintenance costs. In addition, the partial closure will help reduce the environmental impacts of the landfill by improving landfill gas collection efficiency, controlling sedimentation and erosion in the stormwater management system, and minimizing leachate production. Leachate collected at the Baseline Landfill is transported to an off-site treatment and disposal facility. The cost to dispose of leachate collected at the landfill has nearly doubled in recent years and is one of the most expensive ongoing operations costs to the County. In addition, since many wastewater treatment plants are imposing stricter quality requirements on the wastewater they receive, leachate treatment costs will likely substantially increase in the near future and facilities accepting leachate will be more limited.

The landfill re-grading described above will require relocating approximately 500,000 cubic yards of buried MSW from the interior of the landfill cells to the exterior side slopes. This waste may be screened to recover clean soil, which could be used for landfill operations such as daily or intermediate cover soil. The quantity of recovered screened soil varies depending on the landfill and the age of the buried waste, but in a study[2] of a closed landfill in Escambia County, Florida, approximately 62 percent of the landfill material that was mined was recoverable as soil, although 34 percent of the mined material was recovered final cover soil. Final cover soil has not been placed on the existing Baseline Landfill, so the

[2] P. Jain et al. *Case Study of landfill reclamation at a Florida Landfill Site*. Waste Management, 33 (2013), 109-116.

percentage of recoverable soil would be less than reported in this study. Site-specific investigations would be needed to determine if waste screening is economically feasible.

Once Cell III and the Urban Cell are reconfigured to accept MSW, the area will be filled to the elevations shown on Figure 5. Figures 4 and 5 show the Phase 1 conceptual layout including:

- Phase 1, Cell III footprint: 43 acres.
- Phase 1, Urban Cell footprint: 38 acres.
- Phase 1 soil excavation: 0 cubic yard.
- Phase 1 waste relocation: 500,000 cubic yards.
- Phase 1 waste capacity: 1.4 million tons (1.9 million cubic yards).
- Phase 1 lifespan: 6.5 years (1.56-percent waste growth rate).
- Phase 1 revenue projection: $84,000,000 ($60/ton).

Appendix A presents the engineer's opinion of probable construction cost (EOPCC) to construct Phase 1.

To develop Phase 1, the following supporting infrastructure will need to be relocated:

- Gas Collection and Control System
- Stormwater Management Infrastructure
- Access Road

3.2.2 Capacity and Lifespan

The airspace resulting from reconfiguring Cell III and the Urban Cell was estimated by comparing the volume between the reconfigured cell grading plan (Figures 4A, 4B, and 4C) and the final cover grading plan (Figure 5) as described in Section 3.1.2. The lifespan was estimated as described in Section 2.1.

The proposed re-grading of Phase 1 (Cell III and Urban Cell) is estimated to expand the Baseline Landfill's capacity on the existing footprint by approximately 1.9 million cubic yards and result in an operational lifespan of 6.5 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.2.3 Challenges and Unreconciled Issues

Rule 62-700.430, FAC, requires that a vertical expansion over an unlined landfill include a bottom liner that is sloped toward the new expansion area. The conceptual liner over the Urban Cell slopes to the interior and to the exterior of the landfill. Although this is not expected to be a problem, further clarification is needed from FDEP. In the worst case, an Application for Alternate Procedures may be necessary.

The concerns about karst geology discussed previously are largely eliminated by the previous foundation remediation of Cell III and the depth of waste over the underlying geology that will provide bridging if a subsidence occurs.

3.3 PHASE 2: LANDFILL EXPANSION WITHIN THE CURRENT BASELINE LANDFILL PROPERTY

3.3.1 CONFIGURATION

Phase 2 is immediately south and southeast of the existing Cell III (Phase 1) and is within the existing Baseline Landfill property boundary. Phase 2 would be filled to the maximum permitted elevation of the existing landfill cells (300 feet NGVD29). The Phase 2 footprint would be excavated to a maximum depth of approximately 30 feet below grade (with 3H:1V subgrade side slopes), which would require excavating approximately 400,000 cubic yards of soil. Phase 2 would be filled with 3H:1V side slopes to maximize capacity. Figures 6 and 7 show the Phase 2 conceptual layout, including:

- Phase 2 footprint: 12 acres.
- Phase 2 soil excavation: 440,000 cubic yards.
- Phase 2 waste capacity: 1.3 million tons (1.7 million cubic yards).
- Phase 2 lifespan: 5.4 years (1.56-percent waste growth rate).
- Phase 2 revenue projection: $78,000,000 ($60/ton).

Multiple buildings and site infrastructure would need to be relocated to construct Phase 2 including but not limited to:

- Scale House
- Operations Building
- Administration Building
- Maintenance Building
- Household Hazardous Waste Collection Center
- Cell III Leachate Pumping Station
- Leachate Storage Facility
- Animal Control Center
- Pond E
- Pond F

As part of the conceptual development of an expanded Baseline Landfill, the recently acquired East Parcel will provide space to relocate facilities that conflict with the construction of Phase 2 and additional Phases. Appendix D presents conceptual drawings and a cost estimate for the development of the East Parcel, and Appendix E provides the conceptual development plan for the East Parcel. As part of the conceptual development plan, access directly from the East Parcel to the current Baseline property is included. This will require the permitting and construction of a new at-grade railroad (RR) crossing of the adjacent RR siding. In addition, utility crossings for landfill gas and leachate are also included. In communication with the RR entity, we believe that crossings will be approved but on the RR's timeline. Fortunately, the County has time to work through the RR's permitting process. The cost of the crossings is estimated at $750,000. This amount has been included in the development costs for the Baseline expansion.

Appendix A presents the EOPCC to construct Phase 2 that includes demolition and relocation costs for existing facilities.

3.3.2 Capacity and Lifespan

Phase 2 is estimated to expand the Baseline Landfill's capacity by approximately 1.7 million cubic yards and result in an operational lifespan of 5.4 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.3.3 Challenges and Unreconciled Issues

The Phase 2 expansion would cut off the existing access points to the leachate collection pipes and pump stations in Cell III. These access points would need to be reconfigured to allow cleaning and video inspection of the leachate pipes, in accordance with Paragraph 62-701.500(8)(h), FAC. The leachate collection wet wells associated with the pump stations for Cell III-B, Cell III-C, and possibly Cell III-A would also need to be relocated.

The concerns about karst geology will need to be resolved to construct Phase 2.

3.4 Phase 3: Landfill Expansion within the Current Baseline Landfill Property

3.4.1 Configuration

Phase 3 is immediately west of Cell III and the Urban Cell (Phase 1). Phase 3 would connect to these cells as a lateral and vertical expansion and would reach a maximum elevation of 300 feet NGVD29, consistent with Phase 1 and Phase 2. The Phase 3 footprint would be excavated to approximately 30 feet below grade (with 3H:1V subgrade side slopes), which would require excavating approximately 2.4 million cubic yards of soil. Phase 3 would be constructed with 3H:1V side slopes to maximize capacity. Figures 8 and 9 show the conceptual layout of Phase 3:

- Phase 3 footprint: 61 acres.
- Phase 3 soil excavation: 2.4 million cubic yards.
- Phase 3 waste capacity: 11.6 million tons (15.5 million cubic yards).
- Phase 3 lifespan: 35.5 years (1.56-percent waste growth rate).
- Phase 3 revenue projection: $696,000,000 ($60/ton).

To develop new cells, the following supporting infrastructure will need to be removed and/or relocated to adjacent property and/or the East Parcel:

- Radio Communications Tower
- Used Tire Storage
- Transfer Station
- White Goods Storage
- Pond A
- Pond B

To facilitate development of Phase 3, the DRAs can be relocated to the northwest portion of the Baseline Landfill site, shown as DRA 3 on Figures 3 and 17. Figures 8 and 9 show the conceptual Phase 3 landfill buildout, which assumes that the County will own the entire northwest parcel for use as stormwater management. Appendix A presents the EOPCC to construct Phase 3.

3.4.2 Capacity and Lifespan

Phase 3 is estimated to expand the Baseline Landfill's capacity by approximately 15.5 million cubic yards and result in an operational lifespan of 35.5 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.4.3 Challenges and Unreconciled Issues

The Phase 3 expansion may cut off access points to the leachate collection pipes in Cell III. These access points would need to be reconfigured to allow cleaning and video inspection of the leachate pipes, in accordance with Paragraph 62-701.500(8)(h), FAC. Additionally, existing infrastructure within the footprint of Phase 3 will need to be relocated and coordinated to minimize interruption of operations.

The concerns about karst geology will need to be resolved to construct Phase 3.

3.5 Phase 4: Expansion on Properties Adjacent to the Baseline Landfill

3.5.1 Configuration

Phase 4 is south of Phase 3, would reach the maximum permitted elevation of 300 feet NGVD29, and would be constructed on land that the County does not currently own. The Phase 4 footprint would be excavated to approximately 30 feet below grade (with 3H:1V subgrade side slopes), which would require excavating approximately 6.3 million cubic yards of soil. Phase 4 would be filled with 3H:1V side slopes to maximize capacity. Figures 10 and 11 show the conceptual layout of Phase 4:

- Phase 4 footprint: 139 acres.
- Phase 4 soil excavation: 6.3 million cubic yards.
- Phase 4 waste capacity: 24.8 million tons (33.1 million cubic yards).
- Phase 4 lifespan: 41.5 years (1.56-percent waste growth rate).
- Phase 4 revenue projection: $1,488,000,000 ($60/ton).

The Phase 4 footprint encompasses land that currently includes a few residences and associated roads. Water, sewer, electrical, and stormwater piping that likely exist in this area would need to be demolished. However, no landfill infrastructure would need to be relocated.

Appendix A presents the EOPCC to construct Phase 4.

3.5.2 Capacity and Lifespan

Phase 4 is estimated to expand the Baseline Landfill's capacity by approximately 33.1 million cubic yards and result in an operational lifespan of 41.5 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.5.3 Challenges and Unreconciled Issues

Phase 4 is off site of the existing Baseline Landfill property. Expanding to this area would require purchasing land, zoning, and local zoning approval to allow the construction and operation of a landfill in an area that is not currently zoned for this use.

The concerns about karst geology will need to be resolved to construct Phase 4.

3.6 Phase 5: Expansion on Properties Adjacent to the Baseline Landfill

3.6.1 Configuration

Phase 5 is south of Phase 2, would reach the maximum permitted elevation of 300 feet NGVD29, and would be constructed mostly on land that the County does not own. The Phase 5 footprint would be excavated to approximately 30 feet below grade (with 3H:1V subgrade side slopes), which would require excavating approximately 1.7 million cubic yards of soil. Phase 5 would be constructed with 3H:1V side slopes to maximize capacity. Figures 12 and 13 show the conceptual layout of Phase 5:

- Phase 5 footprint: 42 acres.
- Phase 5 soil excavation: 1.7 million cubic yards.
- Phase 5 waste capacity: 6.1 million tons (8.1 million cubic yards).
- Phase 5 lifespan: 7.1 years (1.56-percent waste growth rate).
- Phase 5 revenue projection: $366,000,000 ($60/ton).

The Phase 5 footprint encompasses land that currently includes residences and associated roads. Water, sewer, electrical, and stormwater piping likely exist in this area that would need to be demolished. However, no landfill infrastructure would need to be relocated.

Appendix A presents the EOPCC to construct Phase 5.

3.6.2 Capacity and Lifespan

Phase 5 is estimated to expand the Baseline Landfill's capacity by approximately 8.1 million cubic yards and result in an operational lifespan of 7.1 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.6.3 Challenges and Unreconciled Issues

Phase 5 is off site of the existing Baseline Landfill property. Expanding to this area would require purchasing land, zoning, and local zoning approval to allow the construction and operation of a landfill in an area that is not currently zoned for this use.

The concerns about karst geology will need to be resolved to construct Phase 5.

3.7 Phase 6: Expansion in Valley Between Phases

3.7.1 Configuration

Phase 6 is a "valley fill" between Phases 1 through 3 to the north and Phases 4 and 5 to the south. Because Phase 6 involves vertical expansions over the side slopes of Phases 2, 3, 4, and 5, a relatively large amount of airspace can be gained for a relatively small amount of bottom-liner construction. The Phase 6 footprint, or area between Phases 1 through 3 and 4 through 5, would be excavated to approximately 30 feet below grade (with 3H:1V subgrade side slopes), which would require excavating approximately 330,000 cubic yards of soil. Phase 6 would be constructed with 3H:1V side slopes to maximize capacity. Figures 14 and 15 show the conceptual layout of Phase 6:

- Phase 6 footprint: 15 acres.
- Phase 6 soil excavation: 330,000 cubic yards.
- Phase 6 waste capacity: 13.4 million tons (17.8 million cubic yards).
- Phase 6 lifespan: 13.3 years (1.56-percent waste growth rate).
- Phase 6 revenue projection: $804,000,000 ($60/ton).

The Phase 6 footprint covers land that could include future landfill access roads, SE 66th Street, and gas piping for the Baseline Landfill. This infrastructure would need to be relocated.

Appendix A presents the EOPCC to construct Phase 6.

3.7.2 Capacity and Lifespan

Phase 6 is estimated to expand the Baseline Landfill's capacity by approximately 17.8 million cubic yards and result in an operational lifespan of 13.3 years (1.56-percent growth scenario). Appendix B provides a detailed capacity and lifespan analysis.

3.7.3 Challenges and Unreconciled Issues

Phase 6 will be on the existing Baseline Landfill property and previously off-site property that was acquired to construct Phases 4 and 5. Challenges to developing this phase related to karst, purchasing land, zoning, and local zoning approval will have been resolved as part of earlier phase development.

3.8 Phase Summary

Table 3-1 shows the expected lifespans of each expansion phase for each growth-rate scenario. Table 3-2 presents the estimated capacity, volume, and lifespan for each phase. Table 3-3 presents the soil balance summary, which shows the soil gained from excavating to construct each cell (Soil Cut) and the soil required to construct, operate, and close the landfill. Graphic 1 is a visual representation of the Phase Summary; Capacity, Lifespan, Total Cost, and Total Projected Revenue for each Phase as well as an On-Site and Off-Site Summary are displayed. The projected lifespan is based on the 1.56-percent scenario, and Projected Revenue is based on an assumed tipping fee of $60/ton.

Table 3-1 Baseline Landfill Conceptual Lifespan

Phase	0.94-Percent Growth (years)	**1.56-Percent Growth (years)***	3.5-Percent Growth (years)
Phase 1	6.8	**6.5**	5.7
Phase 2	5.8	**5.4**	4.3
Phase 3	42.4	**35.5**	23.9
On-Site Subtotal	*55.0*	***47.4***	*33.9*
Phase 4	56.5	**41.5**	22.8
Phase 5	10.2	**7.1**	3.7
Phase 6	19.6	**13.3**	6.7
Off-Site Subtotal	*86.3*	***61.9***	*31.5*
Total	141.4	**109.3**	65.5

*The 1.56% growth rate is the primary lifespan projection used in this report.

Table 3-2 Phase Summary

Phase	Capacity (tons)	Volume (cubic yards)	Lifespan* (years)
Phase 1	1,400,000	1,900,000	6.5
Phase 2	1,300,000	1,700,000	5.4
Phase 3	11,600,000	15,500,000	35.5
On-Site Subtotal	*14,300,000*	*19,100,000*	*47.4*
Phase 4	24,800,000	33,100,000	41.5
Phase 5	6,100,000	8,100,000	7.1
Phase 6	13,400,000	17,800,000	13.3
Off-Site Subtotal	*44,300,000*	*59,000,000*	*61.9*
Total	**58,600,000**	**78,100,000**	**109.3**

*Lifespan projections given for the 1.56-percent growth rate scenario. Actual lifespan will depend on tonnage acceptance rates.

Graphic 1 Baseline Landfill Expansion Details

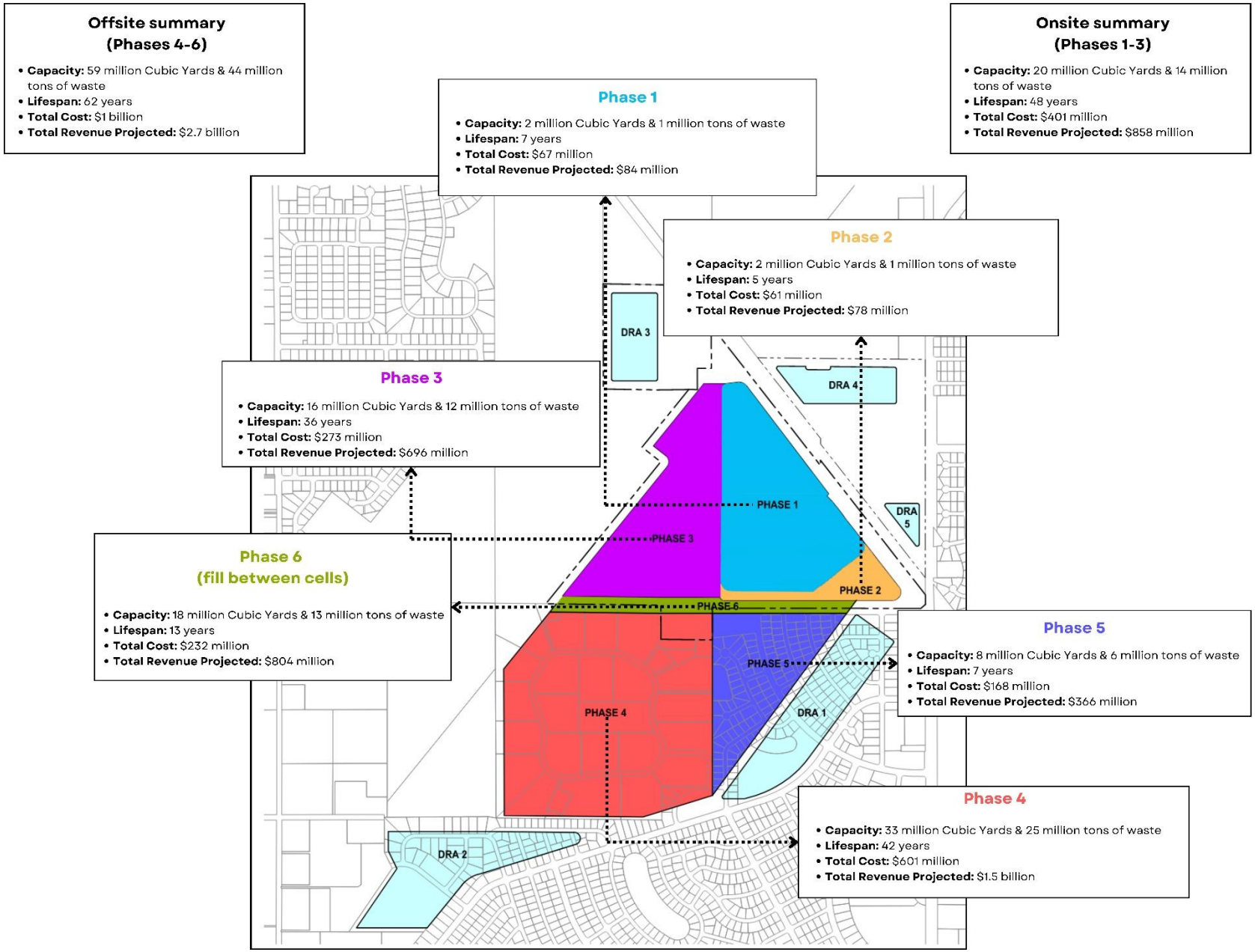


Table 3-3 Soil Balance Summary

Phase	Soil Cut (CY)	Construction Soil Fill (CY)	Operation Cover Soil (CY)*	Closure Soil (CY)	Net Soil Available (CY)
Phase 1	0	90,000	190,000	340,000	-620,000
Phase 2	440,000	50,000	170,000	50,000	170,000
Phase 3	2,440,000	240,000	1,550,000	260,000	390,000
On-Site DRAs	670,000	0	0	0	670,000
On-Site Subtotal	*2,880,000*	*380,000*	*1,910,000*	*650,000*	*620,000*
Phase 4	6,270,000	560,000	3,310,000	590,000	1,810,000
Phase 5	1,720,000	170,000	810,000	180,000	570,000
Phase 6	330,000	60,000	1,780,000	60,000	-1,580,000
Off-Site DRAs	740,000	0	0	0	740,000
Off-Site Subtotal	*8,320,000*	*790,000*	*5,900,000*	*830,000*	*1,540,000*
Total	**11,200,000**	**1,170,000**	**7,810,000**	**1,480,000**	**2,150,000**

*Operation Cover Soil quantities assume that soil volume is 10 percent of the waste volume. If more soil is used, the quantity of Net Soil Available could change significantly.

3.8.1 Soil Balance

Table 3-3 shows the soil balance during the construction of each new landfill phase. The *Soil Cut* is the quantity of soil excavated for constructing each phase of the landfill expansion. *Construction Soil Fill* is the 2 feet of drainage and protective soil placed above the bottom liner. *Operation Cover Soil* is the soil used as daily cover during the operational life of the landfill; for this analysis, 10 percent of the total waste volume was assumed, although this value varies significantly from site to site and a small difference in this value could determine if the facility is soil rich or soil poor. *Closure Soil* is the 2 feet of soil placed as part of final closure construction, assuming that 1 foot of intermediate soil has already been placed as part of landfill operations. *Net Soil Available* is the difference between the Soil Cut volume and the total volume of the Construction, Operation, and Closure soil.

During construction of Phase 1, the facility will be soil poor, since no soil needs to be excavated. For that reason, the County may choose to begin excavating in the footprints of the future phases to provide soil, which may require additional land use permitting. If the site is soil poor, the County may manufacture topsoil that is 50-percent soil and 50-percent yard waste using the green waste from on site. The manufacturing of this topsoil would reduce the total Phase 1 through 6 soil requirement for intermediate closure by approximately 370,000 cubic yards and for closure construction by approximately 280,000 cubic yards.

3.8.2 Vertical Expansion

The Baseline Landfill is currently permitted to a maximum elevation of 300 feet NGVD29. This current maximum elevation was assumed for the lifespan and capacity calculations for Phases 1 through 6. However, if a permit modification were obtained that allowed a vertical landfill expansion, additional waste capacity could be gained. Geotechnical and structural

evaluations would be needed to determine the feasibility and extent of a vertical expansion. This vertical expansion would provide the following:

- Vertical expansion footprint: No net increase in footprint.
- Vertical expansion soil excavation: 0 cubic yards.
- Vertical expansion waste capacity: 13.3 million tons (17.7 million cubic yards).
- Vertical expansion lifespan: 11 years (1.56-percent waste growth rate).
- Vertical expansion revenue projection: $797,000,000 ($60/ton).
- If the vertical expansion is technically feasible, then no construction costs would be expected since it would be an expansion over an existing constructed landfill. Operation costs would still be incurred at an estimated $15.00 per ton in 2024 dollars.

3.8.3 East Parcel Expansion

The East Parcel, to the east of the existing Baseline Landfill, is owned by the County and could be used for relocating existing infrastructure, as discussed in this report. However, this area could also be used to construct a landfill expansion.

- East parcel footprint: 55 acres.
- East parcel soil excavation: 0 cubic yards.
- East parcel waste capacity: 12 million tons (16 million cubic yards).
- East parcel lifespan: 42 years if opened in 2028 or 10 years if opened after Phases 1 through 6 are filled (1.56-percent waste growth rate).
- East parcel revenue projection: $720,000,000 ($60/ton).
- Total expansion cost: $268,000,000.

4 PROJECTED REVENUE AND ENGINEER'S OPINION OF PROBABLE CONSTRUCTION COST

4.1 BACKGROUND AND COST ESTIMATE METHODOLOGY

4.1.1 BROAD SCOPE LANDFILL CONSTRUCTION COSTS

By reviewing historical costs for constructing Class I landfills, a rough estimate of cost per acre can be calculated for the typical landfill expansion. An expansion at the Baseline Landfill will also require upgrades to account for the karst topography; an approximate upgrade cost per acre can be added to the construction cost for a total development cost per acre. This value can be applied to future landfill expansions to estimate a rough-order-of-magnitude cost.

4.1.2 TYPICAL LANDFILL EXPANSION CONSTRUCTION COSTS

The cost to construct the landfill expansions proposed for the Baseline Landfill will include the costs to excavate and grade the site, construct the bottom liner and leachate collection system, construct or upgrade a landfill gas collection system, and construct supporting haul roads and electrical and communication utilities. Table 4-1 presents the historical costs of constructing several Florida landfill expansions that were compiled to provide preliminary budget-level opinions of the probable costs suitable for this study. The table includes the final construction cost, date, and expansion acreage for each expansion project. These costs were adjusted to 2024 dollars using the Engineering News-Record (ENR) *Construction Cost Index* and divided by their acreage to obtain a broad-scope unit price. These costs ranged from $620,000 per acre to $1,539,000 per acre and averaged $752,000 per acre.

Table 4-1 Costs of Florida Landfill Expansions

Landfill	Year	Landfill Lined Area (acres)	Total Cost (Original Bid)	Total Cost (2024 Adjusted)	Cost/Acre (2024 Adjusted)
Sarasota County CCSWDC Phase III	2021	52.8	$32,614,219.90	$36,340,000	$688,000
Polk County NCLF Phase VI*	2021	25.4	$20,654,427.93	$23,010,000	$906,000
Citrus County CCCL Phase 4A**	2023	10	$15,207,993.79	$15,390,000	$1,539,000
Brevard County Cell 1	2015	41	$16,722,395.87	$22,530,000	$548,000
				Weighted Average	**$752,000**

*NCLF Phase VI was constructed in two stages.

**CCCL Phase 4A included significant quantities of earthwork.

4.1.3 KARST FOUNDATION UPGRADES COST

The Baseline Landfill is on a site where karst features (such as sinkholes) have been reported. For that reason, additional features must be constructed to minimize the formation of sinkholes and support the landfill bottom liner if a sinkhole does occur. Constructing Cells III-B and III-C includes additional precautions such as preloading,

compaction grouting, and installing high-strength geotextiles. Based on the costs of the previous work performed for the foundation improvements made at Baseline, an updated cost of $217,000 per acre for future work was estimated. The construction cost estimate in Appendix A includes this cost.

4.1.4 Equipment Cost

Before operations can begin at the expanded Baseline Landfill, new operating equipment would need to be purchased or leased. Table 4-2 presents a list of equipment items and the estimated costs to purchase. These capital costs and operation and maintenance costs have been included in the estimated cost of landfill operations.

Table 4-2 Summary of Costs: Baseline Landfill Expansion

Asset	Quantity	Cost/Unit	Total Cost
Landfill Compactor	2	$960,284	$1,920,568
Large Dozer	2	$849,548	$1,699,095
Small Dozer	1	$381,108	$381,108
Large Excavator	1	$530,155	$530,155
Medium Excavator	1	$277,181	$277,181
Articulated Dump Truck	2	$551,278	$1,102,557
Large Backhoe	1	$176,699	$176,699
Medium Ag Tractor	1	$139,532	$139,532
Construction Roller Leveler	1	$60,000	$60,000
Water Wagon	1	$195,000	$195,000
GPS System	1	$181,200	$181,200
Light Towers	3	$38,370	$115,110
		Total	**$6,778,204**

4.1.5 Land Purchase Cost

The off-site landfill development concepts, Phases 4, 5, 6, and the DRAs require additional land south and southwest of the Baseline Landfill. As presented in this report, a total of 320 acres is contemplated for the off-site expansion. Developing a market value for the land is not included in the scope of this report, but we can offer a possible value based on the County's recent purchase of the East Parcel. The County paid $4.2 million, or approximately $65,000/acre, for the 65-acre East Parcel that includes 17 acres of land that front Baseline Road. This amount has been included in the development costs for the Baseline Landfill expansion.

4.2 Cost Estimate

Table 4-3 presents a cost estimate for each phase of the Baseline Landfill expansion. The approximate quantities for landfill construction materials were estimated based on the conceptual expansion figures presented in this report; unit prices are based on recent bids, Florida Department of Transportation (FDOT) Pay Item 12-Month Moving Averages, third-party cost estimates, and RS Means Heavy Construction Cost Data.

Each category of cost presented in Table 4-3 is described as follows:

- *Construction Cost* represents the cost to construct the bottom liner and ancillary infrastructure, such as pump stations, which is typical of any landfill expansion.
- *Relocation Cost* is the cost to remove and reconstruct or relocate buildings and other infrastructure in the footprint of the associated landfill expansion phase.
- *Land Purchase Cost* was calculated based on the cost per acre of the recently purchased East Parcel ($4.2 million for 65 acres, or about $65,000 per acre). Based on this unit price, the land purchase of 320 acres (including Phases 4 and 5, DRAs, and adjacent land) is $20.8 million. The County should consult with real estate professionals to determine the market value of the land.
- *Landfill Operation Cost* was calculated based on equipment and labor costs associated with daily landfill operations.
- *Closure Cost* is based on an estimated $363,000 per acre, based on recent final closure cost estimate prepared for the Baseline Landfill. The current estimate of closure construction of Cell III is $20.8 million.

All costs are presented in 2024 dollars. Appendix A provides detailed cost estimate calculations.

Additionally, Graphic 2 visualizes the cost-per-ton analysis performed for each alternative, Out-of-County Disposal and the Conceptual Expansion. Each alternative was evaluated based on $60/ton total or the tipping fee at the Baseline Landfill and Transfer Station. The related costs were evaluated on a per-ton basis for each alternative, and the unallotted money left over after all the costs was labeled as "Remaining Revenue." The Remaining Revenue represents $36.08/ton and $0.82/ton for the Conceptual Expansion and Out-of-County alternatives, respectively.

4.3 Landfill Expansion Versus Off-Site Disposal

Table 4-4 summarizes the costs associated with hauling waste off site to the HOF Landfill. All costs are presented in 2024 dollars. The *Transportation Cost* is based on the approximate cost per ton that the County currently pays to haul waste from the transfer station to the HOF Landfill. The *Out-of-County Disposal Cost* covers the tipping fee at the destination landfill based on the tons of waste that are estimated for each phase. The *Transfer Station Operation Cost* is based on the current cost for operation[3] ($11.81 per ton). The *Transfer Station Maintenance Cost* assumes $2 million of maintenance work every 10 years. The off-site disposal cost of $30 per ton was used because it is the estimated price to purchase new disposal capacity and was provided directly from HOF Landfill management. If out-of-County disposal is selected, a new transfer station is estimated to cost $20 million and will be needed when the existing transfer station reaches maximum capacity. Graphic 3 compares the total out-of-County disposal cost (in orange) and the total expansion cost (in blue) and the difference between the two (in green).

[3] Stantec. *Solid Waste Financial Sustainability and Landfill Fee Analysis – Final Report*. January 16, 2024.

Table 4-3 Summary of Costs: Baseline Landfill Expansion

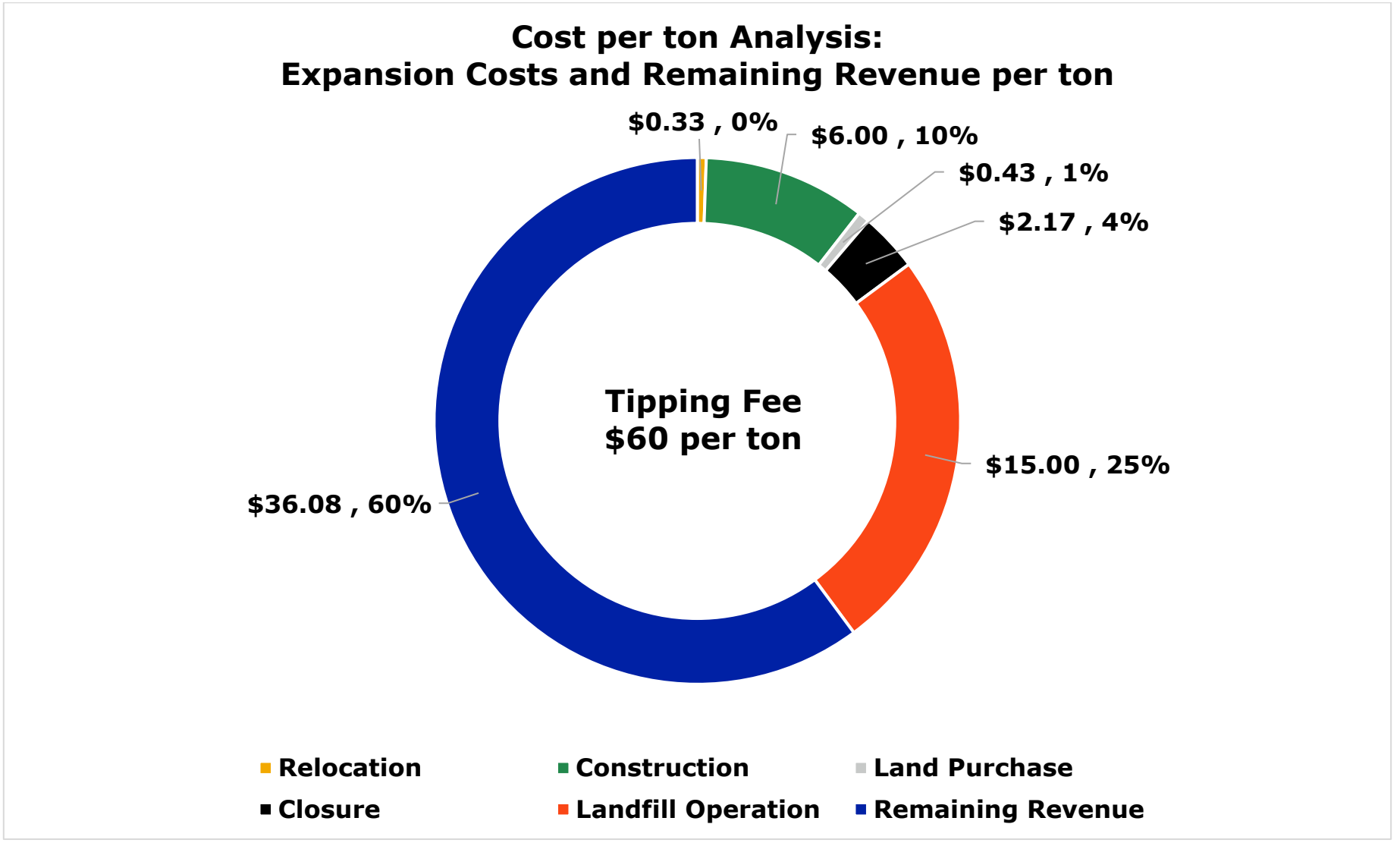
Phase	Construction Cost	Relocation Cost	Land Purchase Cost	Landfill Operation Cost @ $16.00/ton[1]	Closure Cost @ $363,000/acre	Total Cost
Phase 1[2]	$15,100,000	$0		$21,000,000	$29,400,000	$66,900,000
Phase 2	$18,100,000	$17,500,000	$4,200,000	$19,500,000	$4,400,000	$60,900,000
Phase 3	$74,300,000	$1,700,000		$174,000,000	$21,900,000	$273,300,000
On-Site Subtotal	*$107,500,000*	*$19,200,000*	*$4,200,000*	$214,500,000	*$55,700,000*	$401,100,000
Phase 4	171,100,000	$0		$372,000,000	$50,500,000	$600,500,000
Phase 5	$54,500,000	$0	$20,800,00	$91,500,000	$15,200,000	$168,100,000
Phase 6	$18,400,000	$0		$201,000,000	$5,500,000	$231,800,000
Off-Site Subtotal	*$244,000,000*	*$0*	*$20,800,000*	$664,500,000	*$71,200,000*	$1,000,500,000
Total	**$351,500,000**	**$19,200,000**	**$25,000,00**	**$879,000,000**	**$126,900,000**	**$1,401,500,000**

Notes:

[1] Operation cost per ton based on calculations for "Budgetary Construction Cost Estimate - Landfill Operating Costs" provided at the end of the cost estimate in Appendix A.

[2] Phase 1 Urban Cell construction cost is estimated at $11,100,000; Phase 1 Cell III construction cost is estimated at $4,000,000.

Graphic 2A Out-of-County Disposal and the Conceptual Expansion



Graphic 2B Out-of-County Disposal and the Conceptual Expansion

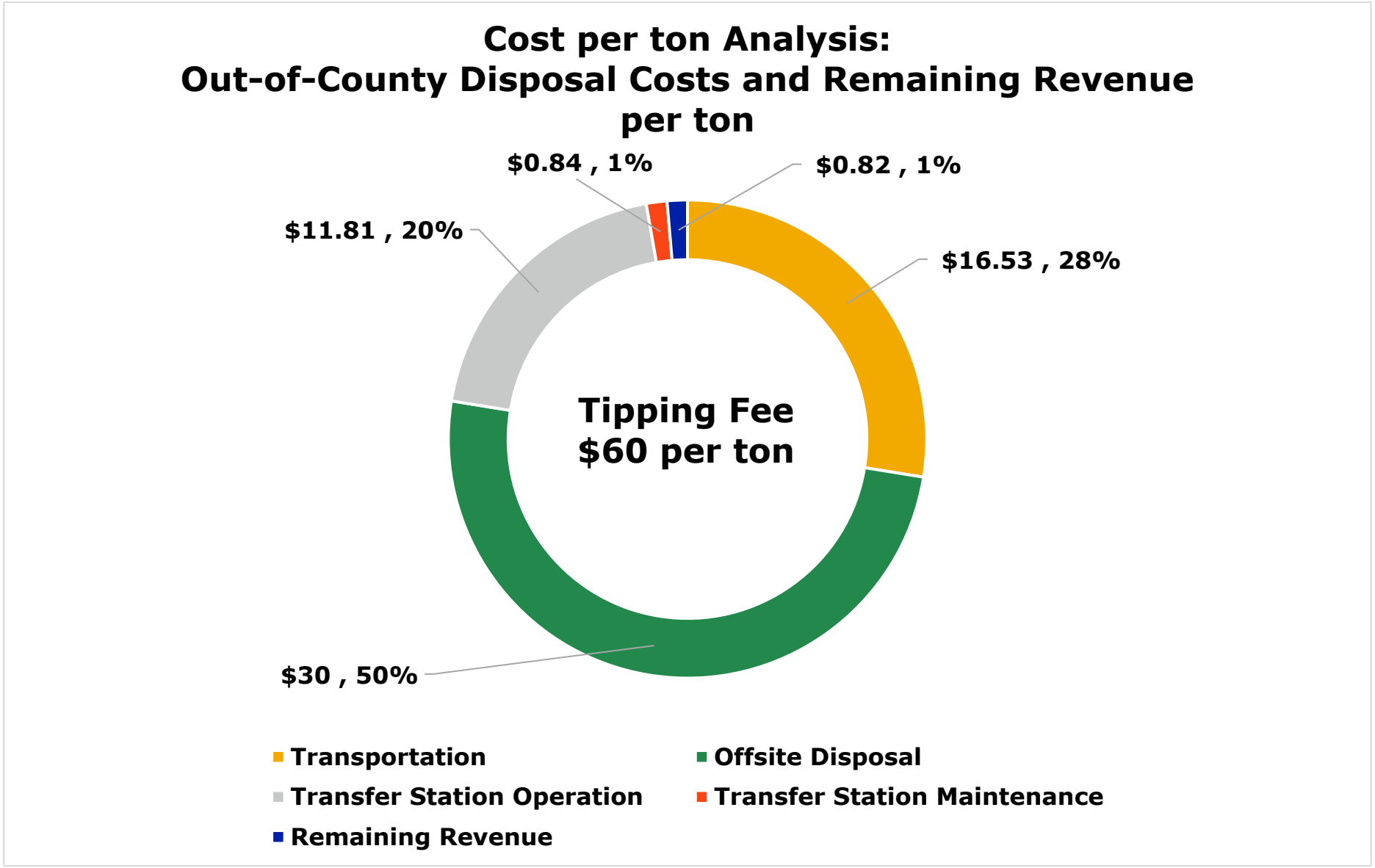


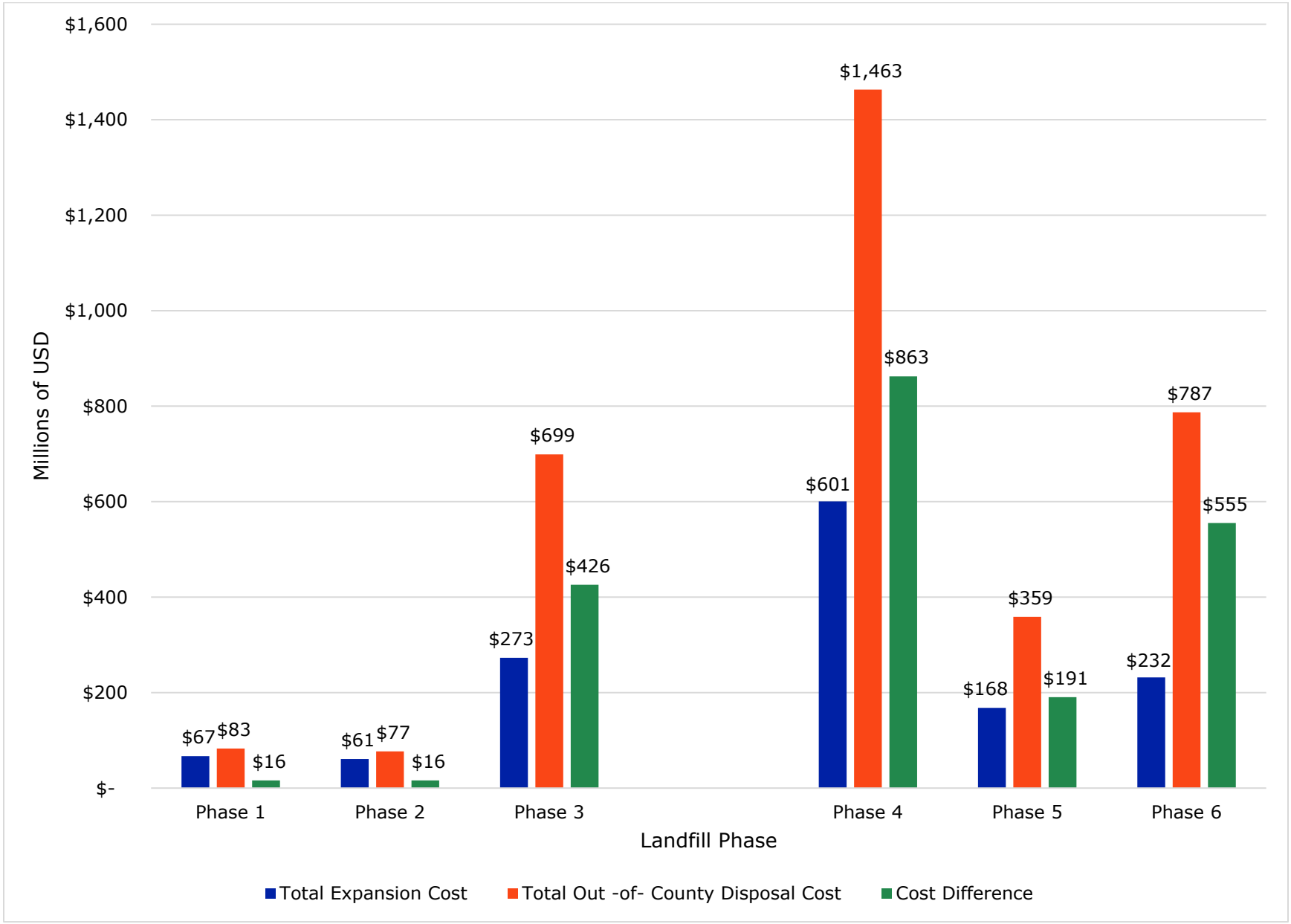
Table 4-4 Summary of Costs: Hauling Waste Out-of-County Disposal

Phase	Transportation Cost @ $16.53/ton	Off-Site Disposal Cost @ $30/ton[1]	Transfer Station Operation Cost @ $11.81/ton	Transfer Station Maintenance Cost	Total Out-of-County Disposal Cost
Phase 1	$23,100,000	$42,000,000	$16,500,000	$1,300,000	$82,900,000
Phase 2	$21,500,000	$39,000,000	$15,400,000	$1,100,000	$77,000,000
Phase 3	$191,700,000	$348,000,000	$137,000,000	$22,100,000	$698,800,000
On-Site Subtotal	*$236,400,000*	*$429,000,000*	*$168,900,000*	*$24,500,000*	*$858,800,000*
Phase 4	$409,900,000	$744,000,000	$292,900,000	$16,600,000	$1,463,400,000
Phase 5	$100,800,000	$183,000,000	$72,000,000	$2,800,000	$358,600,000
Phase 6	$221,500,000	$402,000,000	$158,300,000	$5,300,000	$787,100,000
Off-Site Subtotal	*$732,300,000*	*$1,329,000,000*	*$523,200,000*	*$24,800,000*	*$2,609,300,000*
Total	**$968,500,000**	**$1,758,000,000**	**$692,100,000**	**$49,200,000**	**$3,467,800,000**

Notes:

[1] Appendix F presents the Costs for Off-Site Disposal collected and provided by the Marion County Solid Waste Department.

Graphic 3 Total Expansion Cost Compared to Out-of-County Disposal Cost by Landfill Phase



4.4 Revenue Projection

The revenue-generating capacity of each phase was projected by multiplying the estimated airspace (tons) by the current tipping rate (dollars per ton) of airspace.

Most landfill operators fund their operations by charging a tipping fee for using their facility. Incoming MSW loads from collection vehicles are weighed before and after emptying their trucks in the landfill. The weight difference is determined to be the amount of waste disposed in the landfill. A tipping fee, in dollars per ton of MSW deposited in the landfill, is then charged to the entity delivering the MSW. The tipping fee charged at Marion County's Baseline Landfill is $60 per ton for MSW as of May 2024.

Although much of the revenue received by the County for waste management is from the residential per-parcel assessment, the amount of the assessment is related to the tipping fee and the estimated amount of waste generated by residential units. Using only the tipping fee as the source of revenue to the County in this document approximates the gross revenue from all sources. Including the individual sources of revenue is more relevant when setting disposal fees and which is not the case for this conceptual development plan. Table 4-5 presents the projected revenue generated from the operating life of each landfill phase, assuming an apparent waste density of 1,500 pounds per cubic yard and a $60-per-ton tipping fee. All revenue estimates are presented in 2024 dollars and do not account for inflation. The projected revenue would be the same whether the Baseline Landfill is expanded or waste continues to be disposed of out-of-County.

Table 4-5 Revenue Projections Summary

Phase	Revenue
Phase 1	$84,000,000
Phase 2	$78,000,000
Phase 3	$696,000,000
Onsite Subtotal	$858,000,000
Phase 4	$1,488,000,000
Phase 5	$366,000,000
Phase 6	$804,000,000
Offsite Subtotal	$2,658,000,000
Total	**$3,516,000,000**

5 PROJECTED CONSTRUCTION SCHEDULE

Table 5-1 summarizes the approximate construction schedule based on the conceptual landfill phases and their lifespans. This schedule was prepared by estimating the rough order-of-magnitude duration for completing each milestone based on previous design, permitting, and construction projects. The 1.56-percent waste growth rate is assumed. The projected year is estimated based on the estimated lifespan of each phase calculated in Appendix B. Dates are preliminary and may change significantly with the final design.

Table 5-1 Approximate Construction Timeline

Phase	Milestones	Duration	Approximate Year	Phase Needed By[1]
Phase 1	State Permitting:	12 months	2025	
	Bidding:	6 months	2026	
	Construction:	18 months	2026	
	Open for Waste:		2027	2028
Phase 2	Relocation:[2]	12 months	2029	
	Local Permitting:	12 months	2030	
	State Permitting:	12 months	**2031**[3]	
	Bidding:	6 months	2032	
	Construction:	12 months	2032	
	Open for Waste:		2033	2034
Phase 3	State Permitting:	12 months	2034	
	Local Permitting:	12 months	2035	
	Bidding:	6 months	2036	
	Relocation:	12 months	2037	
	Construction:[4]	12 months	2038	
	Open for Waste:		2039	2039
Phase 4	State Permitting:	12 months	2070	
	Local Permitting:	12 months	2071	
	Bidding:	6 months	2072	
	Construction:[4]	12 months	2073	
	Open for Waste:		2074	2075
Phase 5	State Permitting:	12 months	2112	
	Local Permitting:	12 months	2113	
	Bidding:	6 months	2114	
	Construction:[4]	12 months	2114	
	Open for Waste:		2115	2116
Phase 6	State Permitting:	12 months	2120	
	Bidding:	6 months	2121	
	Construction:	12 months	2122	
	Open for Waste:		2123	2123

[1] *Phase Needed By* date is the approximate date that the waste capacity of the previous phase will be exhausted and additional landfill capacity will be required. The Phase 1 assumed start date is 2028.
[2] Relocation includes demolishing the existing infrastructure in the landfill expansion footprint and reconstructing it.
[3] Marion County's purchased airspace in the HOF Landfill is projected to be exhausted in 2031.
[4] Phases 3, 4, and 5 will likely be constructed in sub-cells. Sub-cell construction will be staggered across the life of the phase. The schedule shown is for the first sub-cell of each phase.

6 RECOMMENDATIONS

Based on the analysis presented in this report, the cost to dispose of solid waste at the County's existing Baseline Landfill is estimated to be *less* expensive than out-of-County disposal. If the conceptual layout and expansion plan conferred by this report were to be adopted, Marion County **has the potential** to save over $2 billion over the lifetime of the expansion. This report provides the County with information that will be useful when making strategic decisions regarding solid waste management in Marion County.

6.1 PHASE 1 – CELL III

The reconfiguration of Cell III as presented in the Phase 1 expansion option is nearly identical to the closure design concept for Cell III. Therefore, work performed for reconfiguration also contributes to the closure construction. Work related to the closure construction can be paid for from the closure escrow account, essentially funding two projects for the price of one. Regardless of the County's decision regarding the expansion of Baseline, Cell III should be reconfigured for either final closure or use as part of Phase 1.

In the near term, the County has an operational Class I landfill that needs attention to function as designed and maintain environmental compliance. Several projects that were planned to be completed before the Cell III closure project have been delayed so that they could be included as part of the Cell III closure project; however, the closure project has been delayed for several years.

Cell III stopped receiving waste in 2019 and has been inactive since but not officially closed. In accordance with Rule 62-701.600, FAC:

> *Final cover shall be placed over the entire surface of each completed solid waste disposal unit or units within 180 days after the final waste deposit, or within the time frame set forth in the approved closure plan*.

The County has not applied to FDEP for a closure permit and does not have an FDEP-approved closure plan. Although the Operations Permit for Cell III was recently renewed for 10 years, no plan is currently in place to resume operations, which leaves the status of Cell III in an unusual regulatory condition. The County intended for the cell to be closed with an impermeable cover within 1 to 2 years after ceasing waste acceptance; however, the project has been delayed. In accordance with Rule 62-701.600, FAC:

> *Nothing herein shall preclude the Department from requiring more stringent final or temporary cover designs in a permit or consent order if necessary to protect the public health or the environment because…the landfill has not been adequately constructed, operated, maintained, or closed.*

Since 2019, cell maintenance has been minimal, resulting in reduced effectiveness of the landfill systems needed to maintain regulatory compliance. Several portions of the cell need maintenance to maintain a high level of protection and regulatory compliance. These items should be addressed on a priority basis.

The Cell III closure project includes installing a final cover system that is designed to minimize rainfall infiltration and reduce the production of leachate. The County currently spends approximately $900,000 per year to transport and dispose of the 5 million gallons of leachate generated annually by Cell III. This cost is likely to increase substantially in the near future as a result of pending restrictions on per- and polyfluoroalkyl substances (PFAS)-related chemical concentrations in wastewater. In its current condition, the landfill is generating approximately the same amount of leachate as it did when active landfilling was in progress. Closure construction should reduce leachate production by approximately 50 percent within a few years and continually decline thereafter.

The County would be well served to proactively manage the landfill for these and other considerations and has reserved the cost to do so as part of the FDEP-required financial assurance escrow account for closure. The current closure escrow account balance for the Cell III closure is approximately $20.8 million and is intended to be used for this purpose.

Recommendations for Short-Term Actions:

- Perform maintenance of Cell III to improve stormwater and erosion controls, leachate seeps, intermediate cover, leachate reduction, grass, and appearance.
- Proceed with reconfiguring Cell III for closure or as part of the Phase 1 expansion.
- Proceed with Phase 1 design and permitting.
- Implement leachate reduction and treatment plan.
- Obtain permits for surface and underground crossings of railroad.
- Establish buffer space, plantings, and berms to minimize visual and noise impacts.

Completing these and other short-term actions will provide a better functioning and safer public facility that enhances the level of environmental protection and compliance.

Recommendations for Mid- to Long-Term Actions:

- Prioritize infrastructure for relocation to the East Parcel.
- Begin development of the East Parcel.
- Evaluate options for relocating the existing communications tower out of the Phase 3 footprint.
- Begin property acquisition to the south.
- Establish the appropriate land use designation and obtain local zoning approval for the East Parcel.
- Decide whether to proceed with subsequent phases.

6.2 PHASE 2

Consolidating Phases 1 and 2 into a single project would provide added benefits versus implementing them as separate phases.

Our recommendation includes the following reasons:

- Construction and operation of Phase 1 will require importing 280,000 cubic yards of clean soil at an estimated cost of $17 per cubic yard or $4.8 million, which includes the costs of material and hauling.

- Phase 2 can provide sufficient excess soil excavation to reduce or eliminate the need for imported soil for Phase 1.
- Phase 2 provides a test case for the permitting of additional cells at the Baseline Landfill.
- With Phase 2 being the smallest of the on-site phases at 12 acres, performing the necessary geological studies and design work is a smaller task than engineering and permitting for the larger cells in Phase 3. This results in a reduced financial risk for the County.

Recommendations for Short-Term Actions:

- Establish the appropriate land use designation and obtain a local zoning approval for Phase 2.
- Begin a geological study of Phase 2.
- Begin permitting Phase 1 and Phase 2.
- Include recommendations for Phase 1.

Recommendations for Mid- to Long-Term Actions:

- Relocate the scale house facility to the south, out of the Phase 2 footprint.
- Decide whether to proceed with subsequent phases.
- Include the recommendations for Phase 1.

6.3 Transfer Station

The solid waste Transfer Station at the Baseline Landfill was constructed in 2003. It is currently the sole solid waste management facility for the County, handling all the waste that is transferred to the HOF Landfill and averaging 750 tons per day. The Transfer Station has a limited capacity for waste that can be processed during a normal working day based on a fully functional transfer station. Several Transfer Station systems are damaged, which reduces the processing capacity of the Transfer Station and impairs safety.

Regardless of the County's decision regarding the mid- to long-term options presented in this report, the Transfer Station will be essential to the County's waste management program for many years and its operational functionality needs to be returned to and maintained so that it performs well to meet the County's needs.

Recommendations for Short-Term Actions:

- Proceed with repairs and improvements to the Transfer Station identified in the *Baseline Transfer Station Damage Evaluation Report* dated June 4, 2024.

The Transfer Station project is expected to take 1 to 1-1/2 years to complete.

6.4 Scale House Facility

The Scale House facility at the Baseline Landfill was also constructed in 2003 as part of the Transfer Station project and is the sole point of entry and exit to the Baseline Landfill for customers. Like the Transfer Station, the Scale House facility is limited in its capacity to process the number of across-the-scale transactions during a normal working day. On some

days, the line of vehicles waiting to cross the scales extends almost to Baseline Road and the wait time for customers can be 50 minutes or more.

The Scale House facility is further limited by settlement that makes keeping the scales calibrated and in legal working order difficult and impairs staff working in the Scale House. An expanded capacity and fully functional Scale House facility are fundamental to the operations at the Baseline Landfill whether waste is transferred out of the County or landfilled at the Baseline Landfill.

Recommendations for Short-Term Actions:

- Proceed with relocating the Scale House facility to the south and outside the footprint of Phase 2.
- Provide two additional automated scales for commercial customers.
- Provide stabilized foundations for the new structures.
- Increase the queuing space.
- Improve the traffic flow.

Completion of the Scale House project is expected to take 1 to 2 years.

6.5 DRA 3/Yard Waste Processing Area

The area shown on Figure 1 as DRA 3 is in the general area of the old unlined McKay dump site. The dump site was investigated the 1990s and again in 2007 as part of an effort to catalog old dumps sites in Marion County. Appendix E provides additional information about the old dump site. To use this space for a drainage retention pond, the area will need additional investigation to determine the limits of waste, depth of waste, and waste characterization. This further investigation will allow for an economic evaluation of the cost of excavating/mining the waste to make the area suitable for other uses. According to the Property Appraiser's website, this property is owned by Marion County.

The County operates its yard waste processing operation on adjacent land to the old dump site. The Marion County Property Appraiser's website shows this area as owned by the State of Florida/Greenway Recreation Area. Over the years, attempts have been made by the County to gain ownership or obtain a lease agreement of this area without success. The County should reconcile ownership, regulatory requirements, and waste management operations in this area.

6.6 Closing Comments

This report is primarily an evaluation between using the existing Baseline Landfill for future waste disposal and transporting waste to an out-of-County landfill. The placement of disposal cells presented herein is a conceptual exercise in space utilization, landfill geometry, and experience in designing solid waste facilities. Based on the assumptions documented in this report, the evaluation shows that landfilling at the Baseline Landfill will be less expensive than out-of-County disposal.

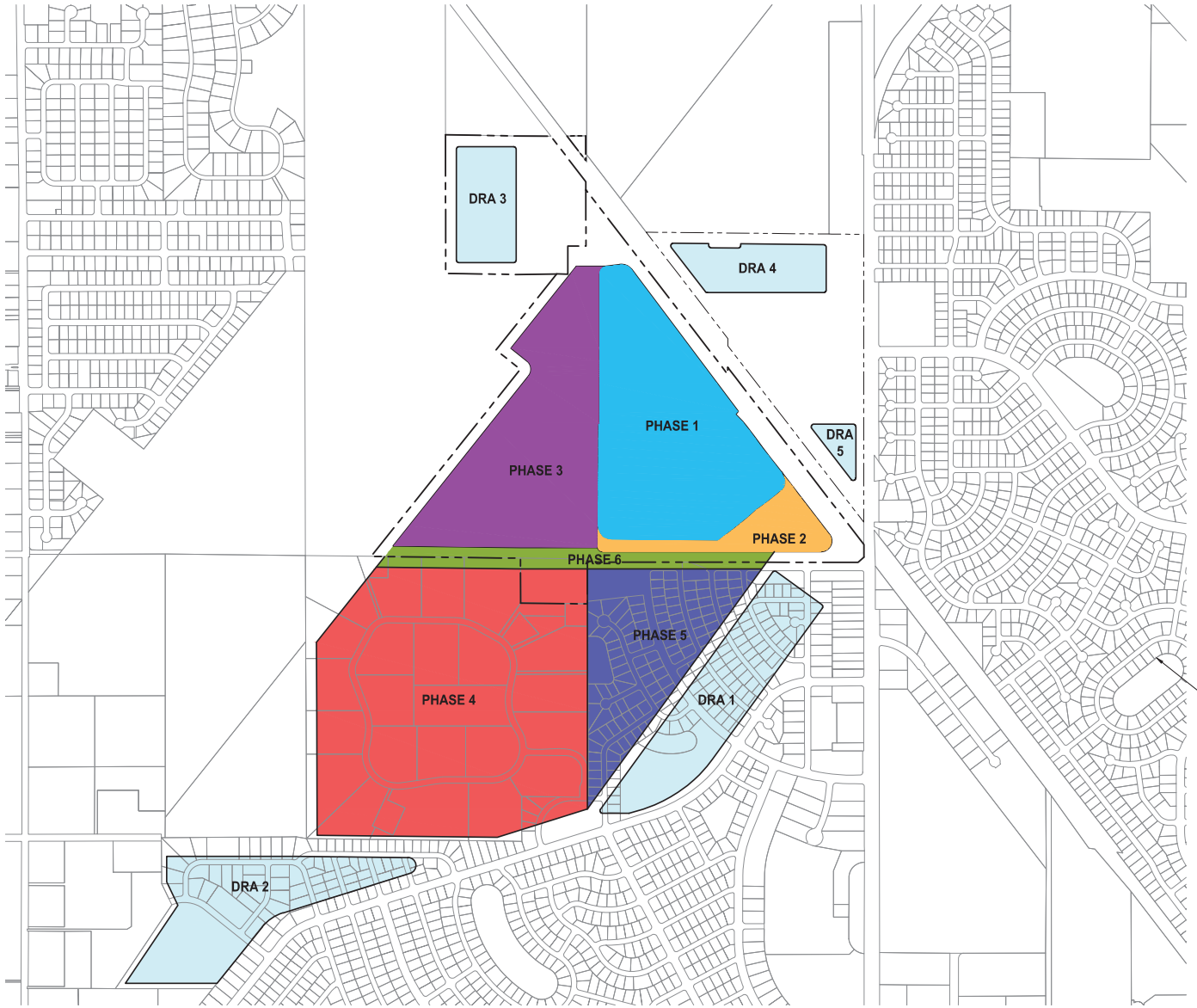
Although these factors are important, they are only one part of the decision-making process to further develop the Baseline Landfill for long-term waste disposal. Before a final decision

is reached, many other state, local, and social considerations will need to be evaluated, many of which are intangible and not readily translated into a financial analysis.

Developing a landfill in an urban setting is not typical of modern solid waste management facilities and will require careful consideration of how best to minimize local impacts. The karst geology of the site also makes developing new disposal cells more complex than would be typical.

Although the original development of the lined cells at the Baseline Landfill in the 1990s provides a template of how to mitigate karst concerns and provide reasonable assurance to FDEP, its repeated approval is uncertain. If the County elects to proceed with the expansion, it will risk the cost of developing a complete landfill expansion permit application before FDEP will make a final determination.

Figures



N

GRAPHIC SCALE
0 250 500 1000
SCALE IN FEET

LEGEND
PROPERTY BOUNDARY
PROPERTY BOUNDARY (EAST PARCEL)

FIGURE 1
OVERALL PLAN
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

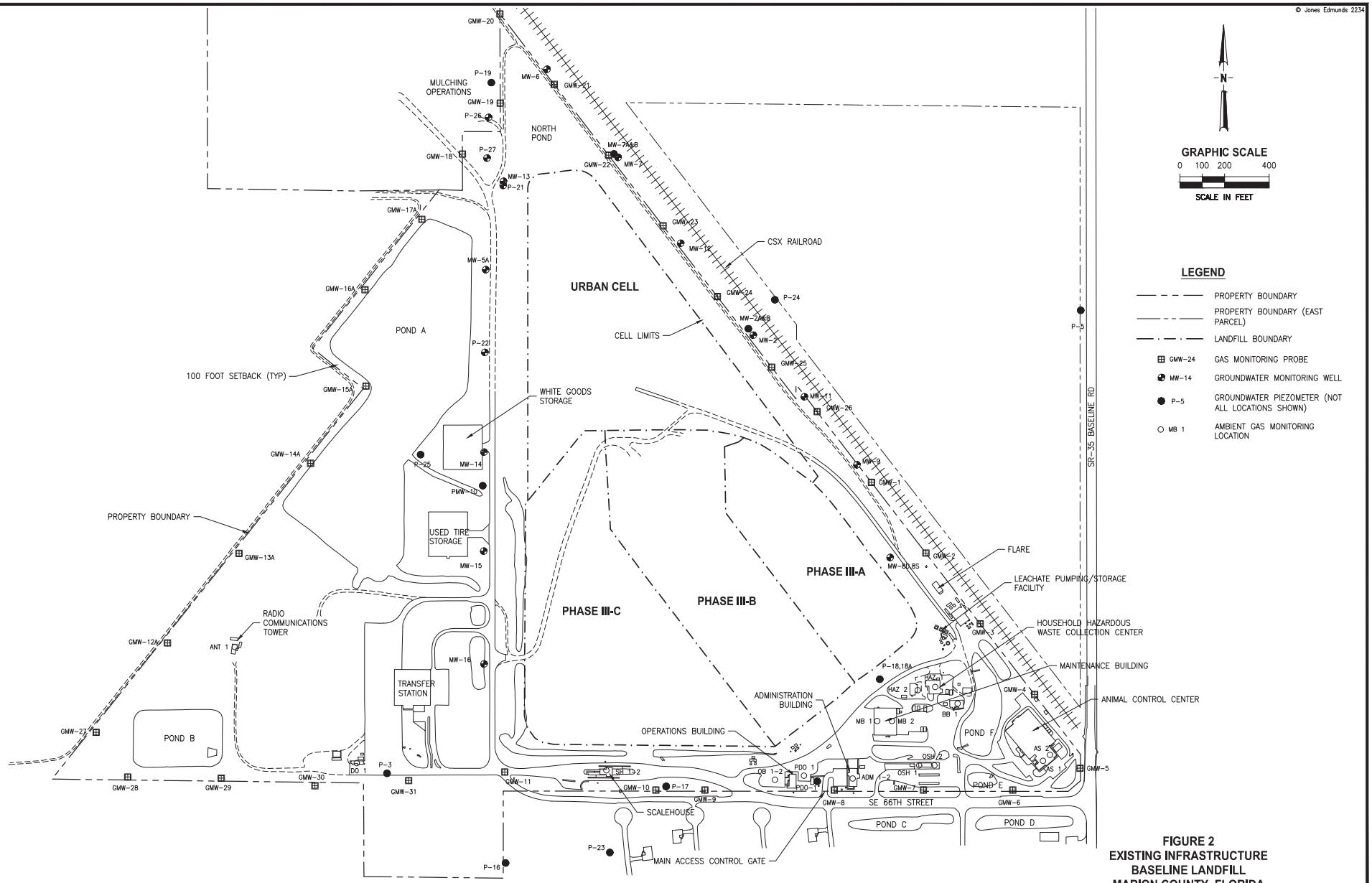


FIGURE 2
EXISTING INFRASTRUCTURE
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

N

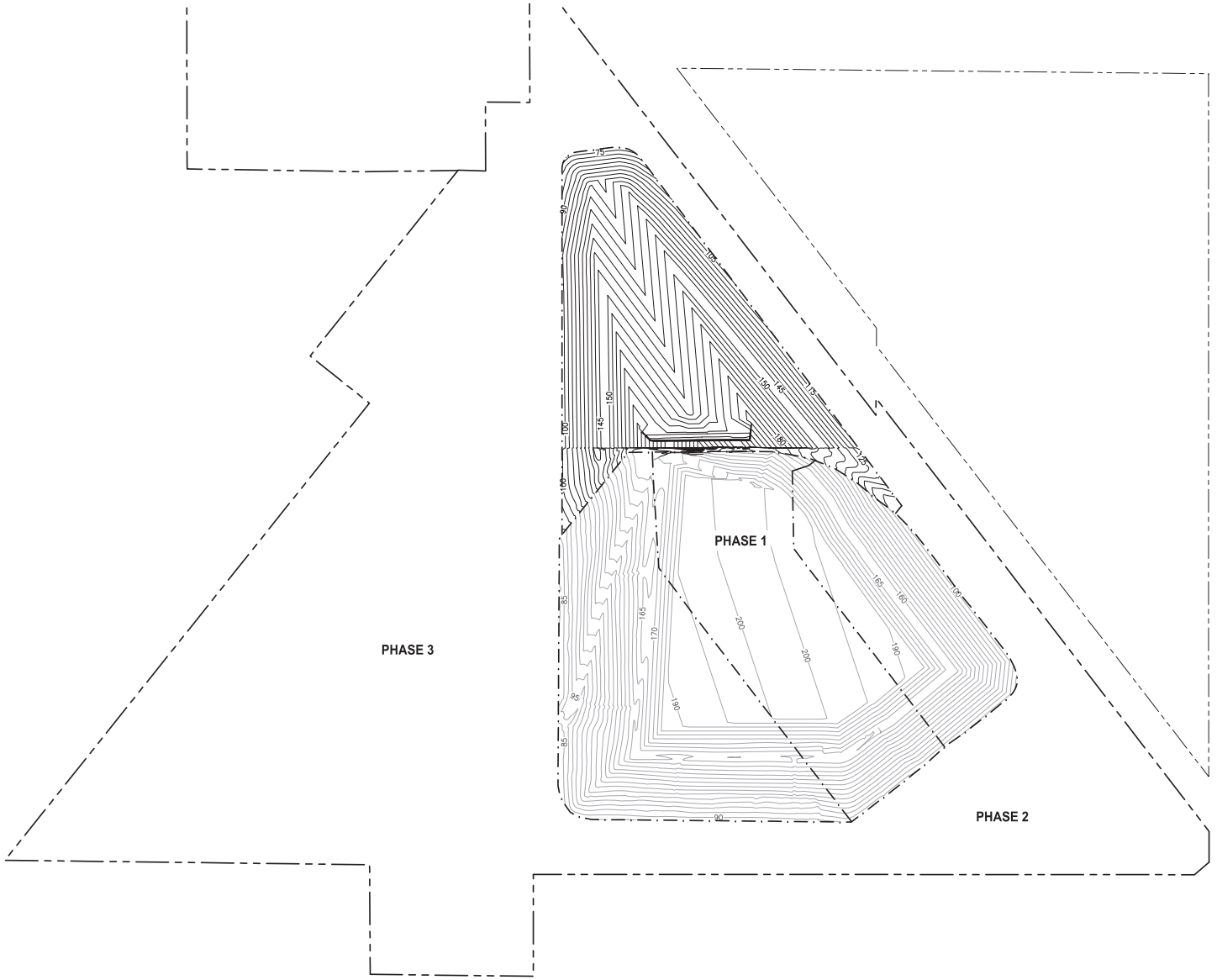
GRAPHIC SCALE
0 125 250 500
SCALE IN FEET

LEGEND

- LIMITS OF EXISTING DISPOSAL CELLS
- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- RAILROAD

FIGURE 3
MASTER BUILDOUT WITH AERIAL
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



N

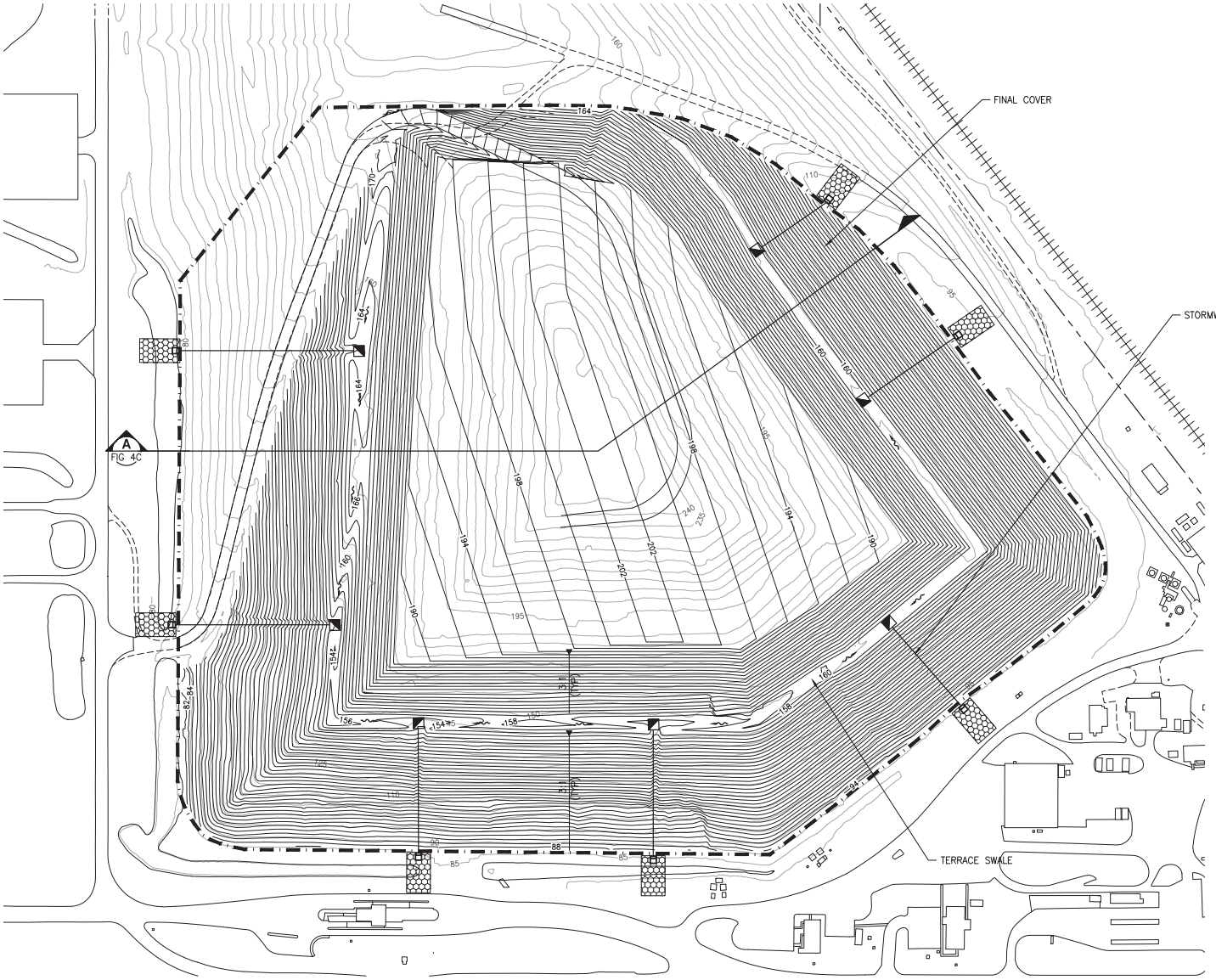
GRAPHIC SCALE
0 100 200 400
SCALE IN FEET

LEGEND

- LIMITS OF EXISTING DISPOSAL CELLS
- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 150 BOTTOM LINER CONTOUR
- 200 EXISTING GRADE CONTOUR

FIGURE 4A
PHASE 1 RECONFIGURATION
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



N

GRAPHIC SCALE
0 50 100 200
SCALE IN FEET

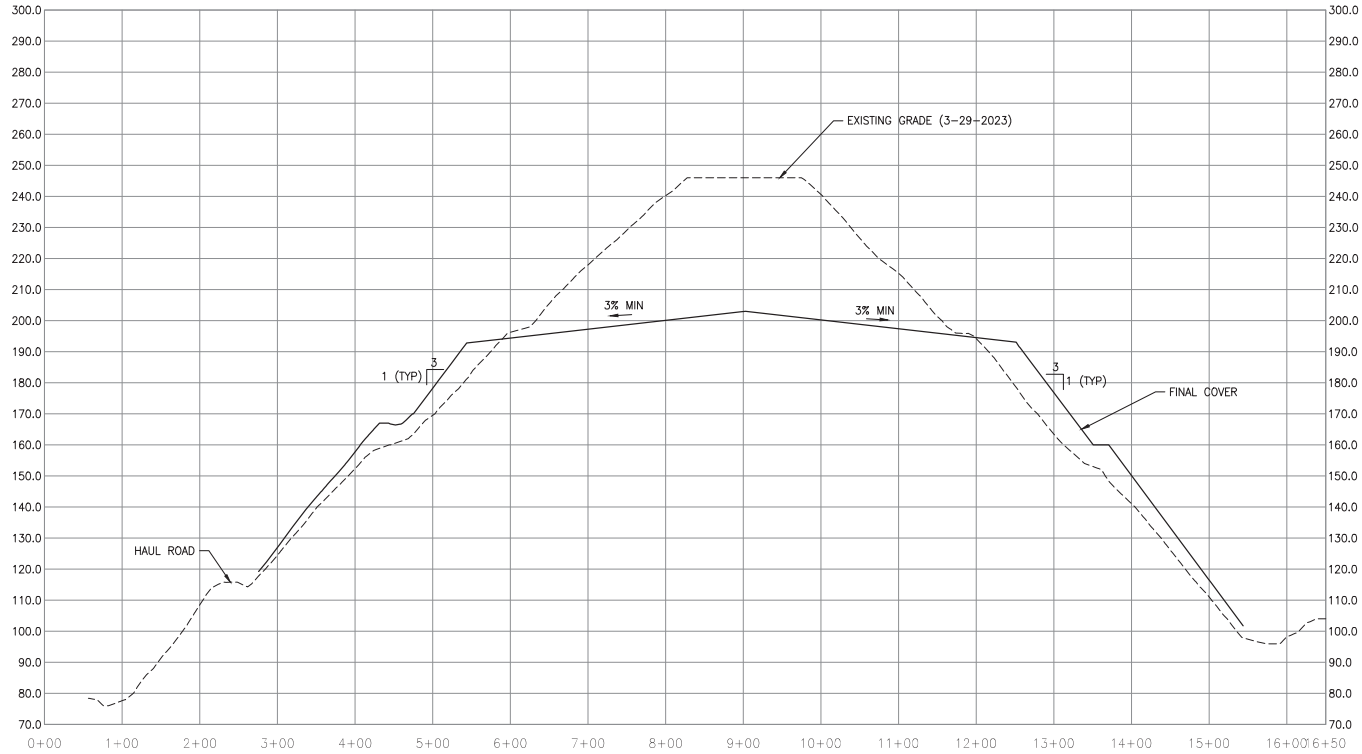
LEGEND

- 03/24/23 SURVEY CONTOURS
- BUILDOUT CONTOUR (TOP OF COVER)
- CELL III EDGE OF LINER
- STORMWATER STRUCTURE
- STORMWATER DOWNCOMER
- ENERGY DISSIPATOR
- GROUT FILLED FIBER REVETMENT
- STORMWATER FLOW

NOTES:
1. FINAL COVER IS 3 FEET HIGHER THAN TOP OF WASTE.
2. MAXIMUM TOP OF COVER ELEVATION NOT TO EXCEED 300 FEET.
3. CONTOURS SHOWN ARE FOR USE BY THE OWNER IN WASTE PLACEMENT AND GRADING PRIOR TO CLOSURE AND UNTIL A FINAL CLOSURE IS DESIGNED AND PERMITTED.

FIGURE 4B
CELL III RECONFIGURATION
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



SECTION A
FIG 4B

GRAPHIC SCALE
0 40 80 160
SCALE IN FEET
HORIZONTAL

GRAPHIC SCALE
0 10 20 40
SCALE IN FEET
VERTICAL

FIGURE 4C
CELL III RECONFIGURATION SECTION
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

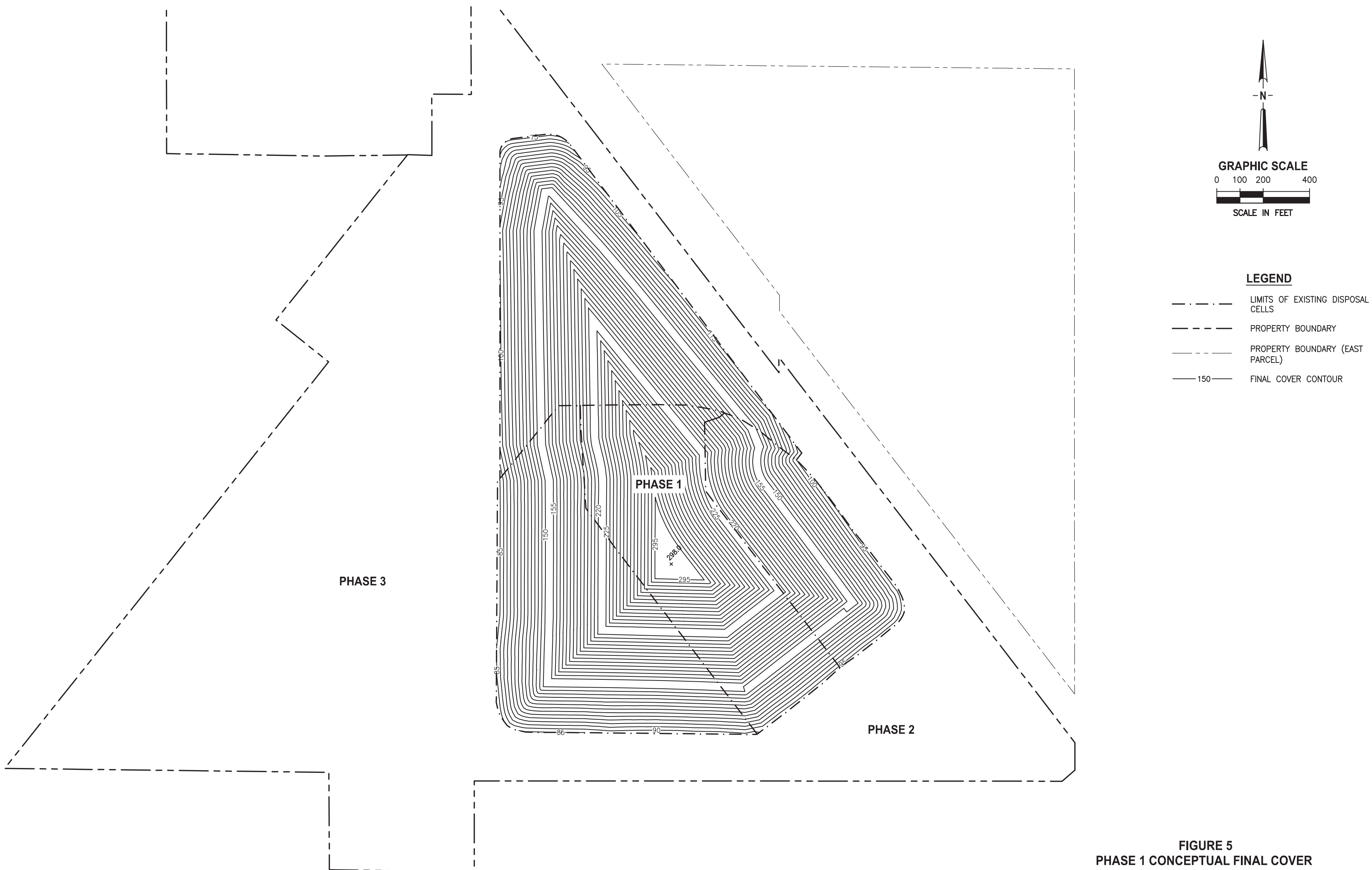
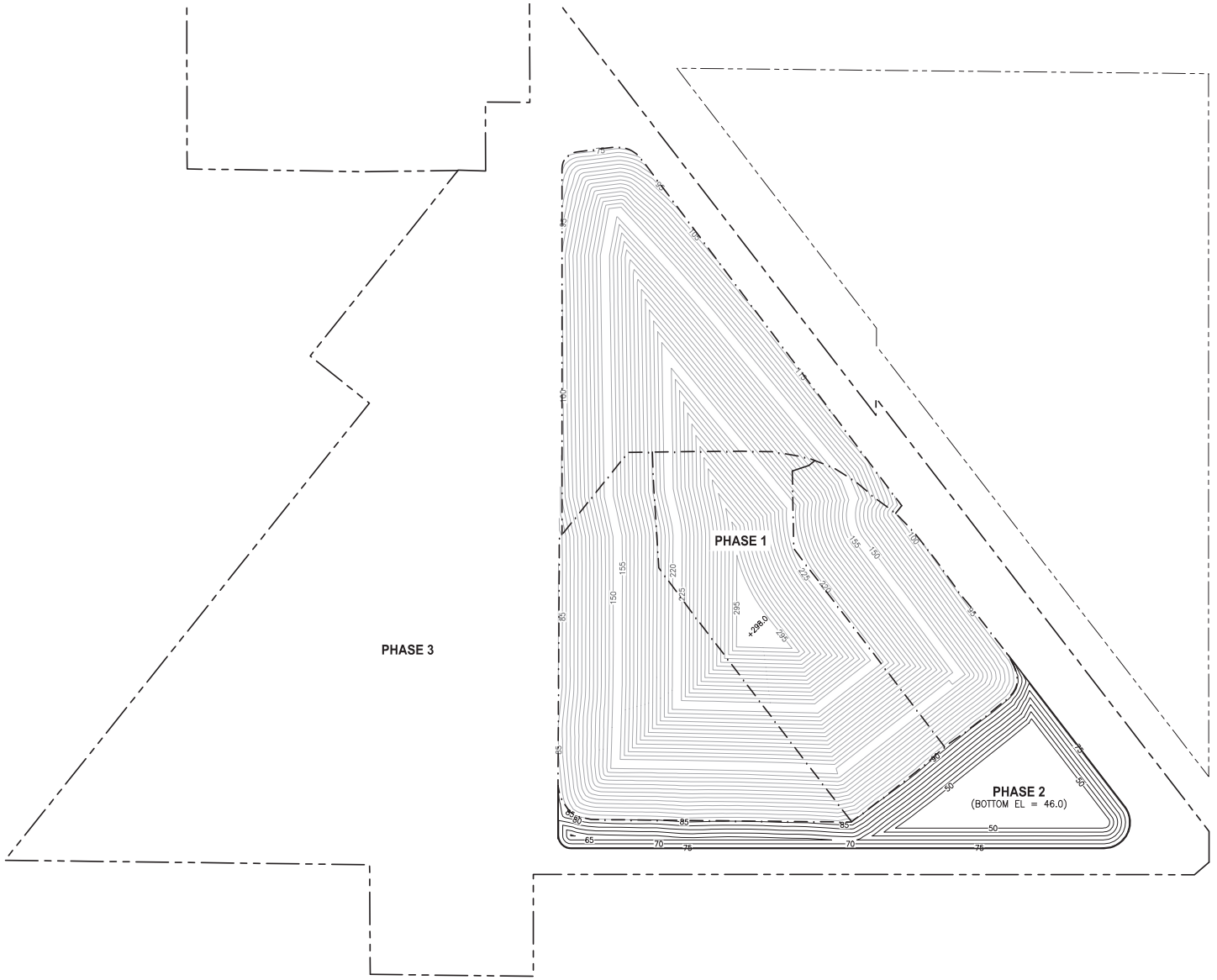


FIGURE 5
PHASE 1 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



N

GRAPHIC SCALE
0 100 200 400
SCALE IN FEET

LEGEND

- LIMITS OF EXISTING DISPOSAL CELLS
- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 70 BOTTOM LINER CONTOUR
- 200 EXISTING GRADE CONTOUR

FIGURE 6
PHASE 2 BOTTOM LINER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

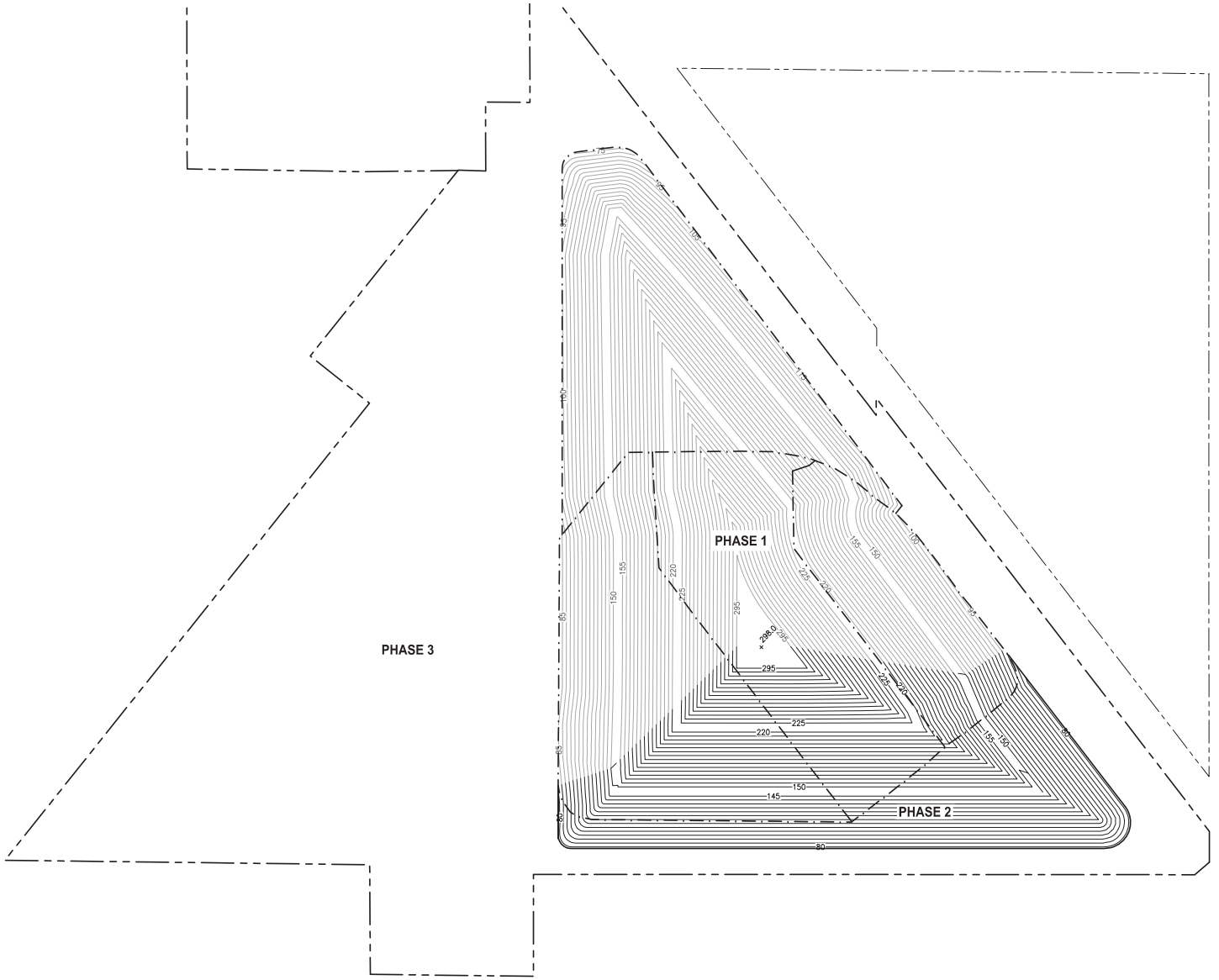


FIGURE 7
PHASE 2 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

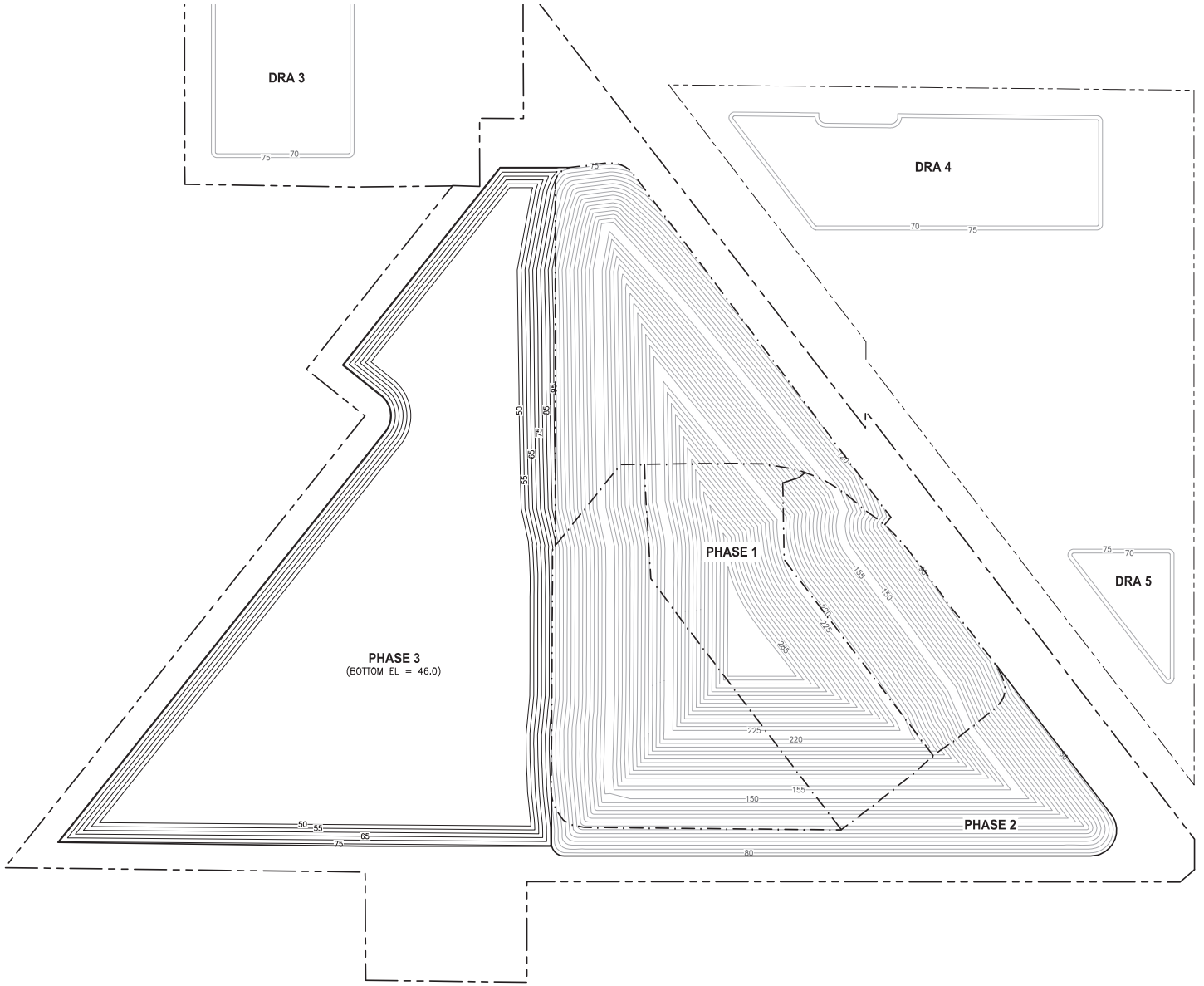


FIGURE 8
PHASE 3 BOTTOM LINER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

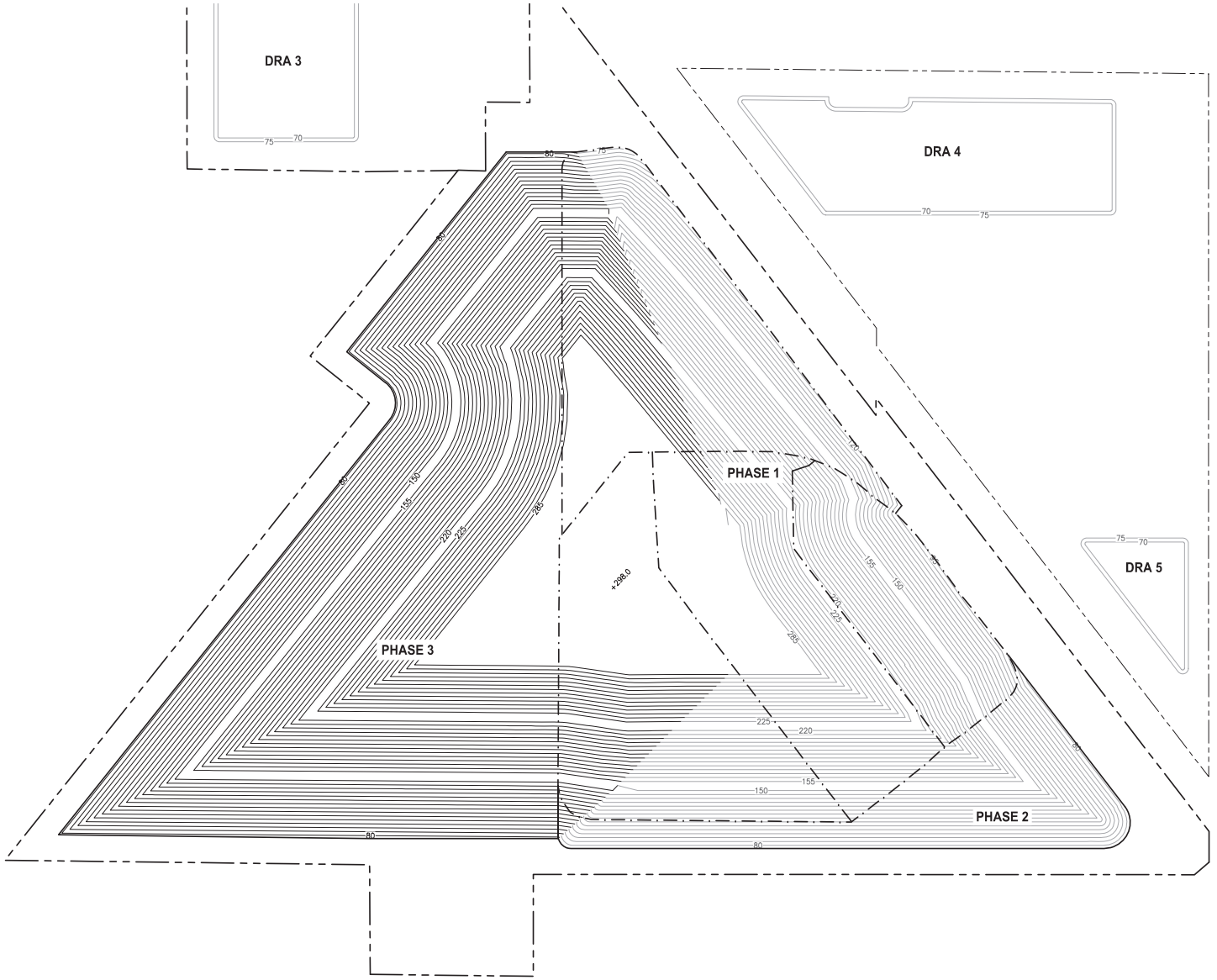


FIGURE 9
PHASE 3 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

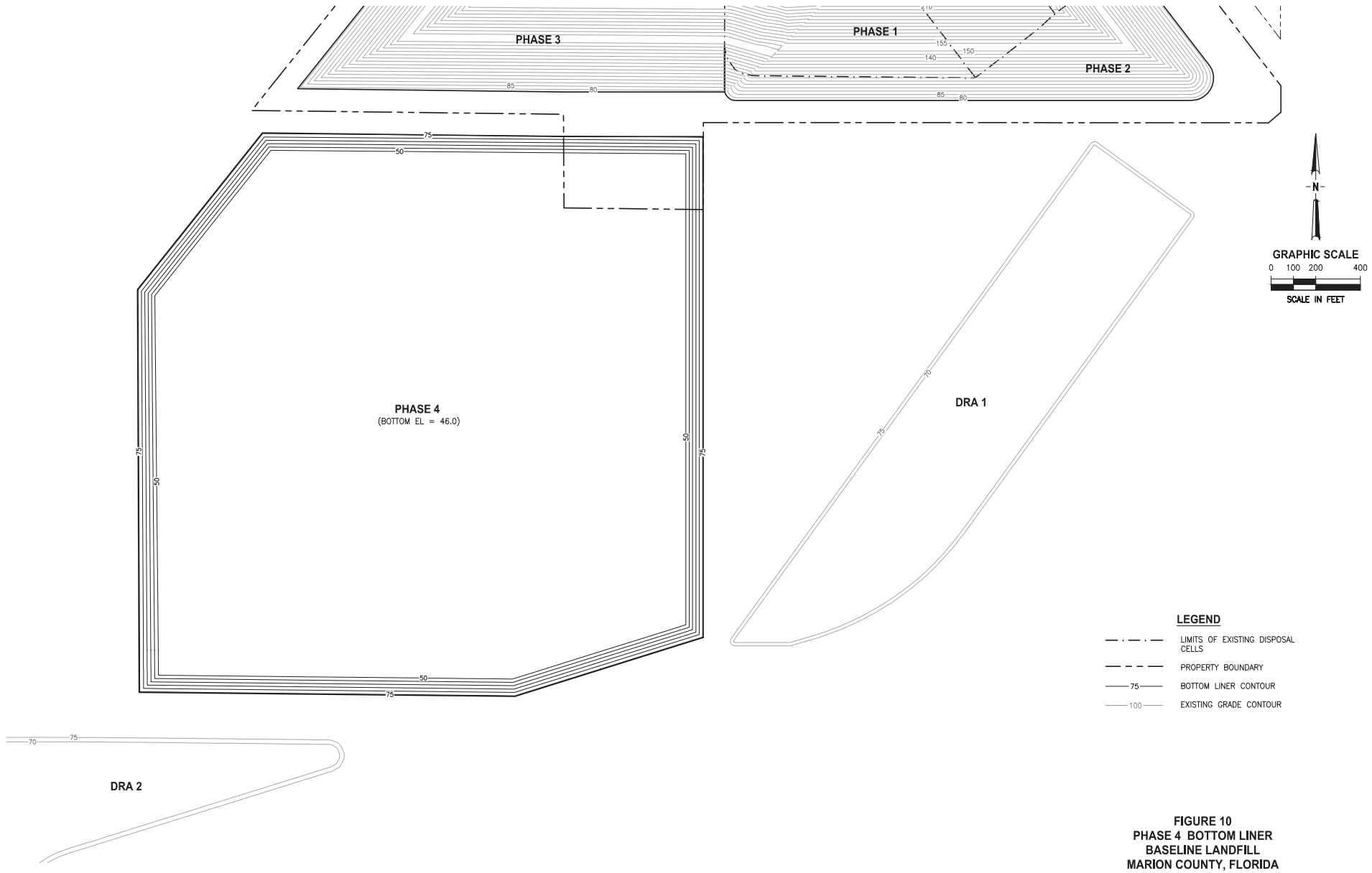


FIGURE 10
PHASE 4 BOTTOM LINER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

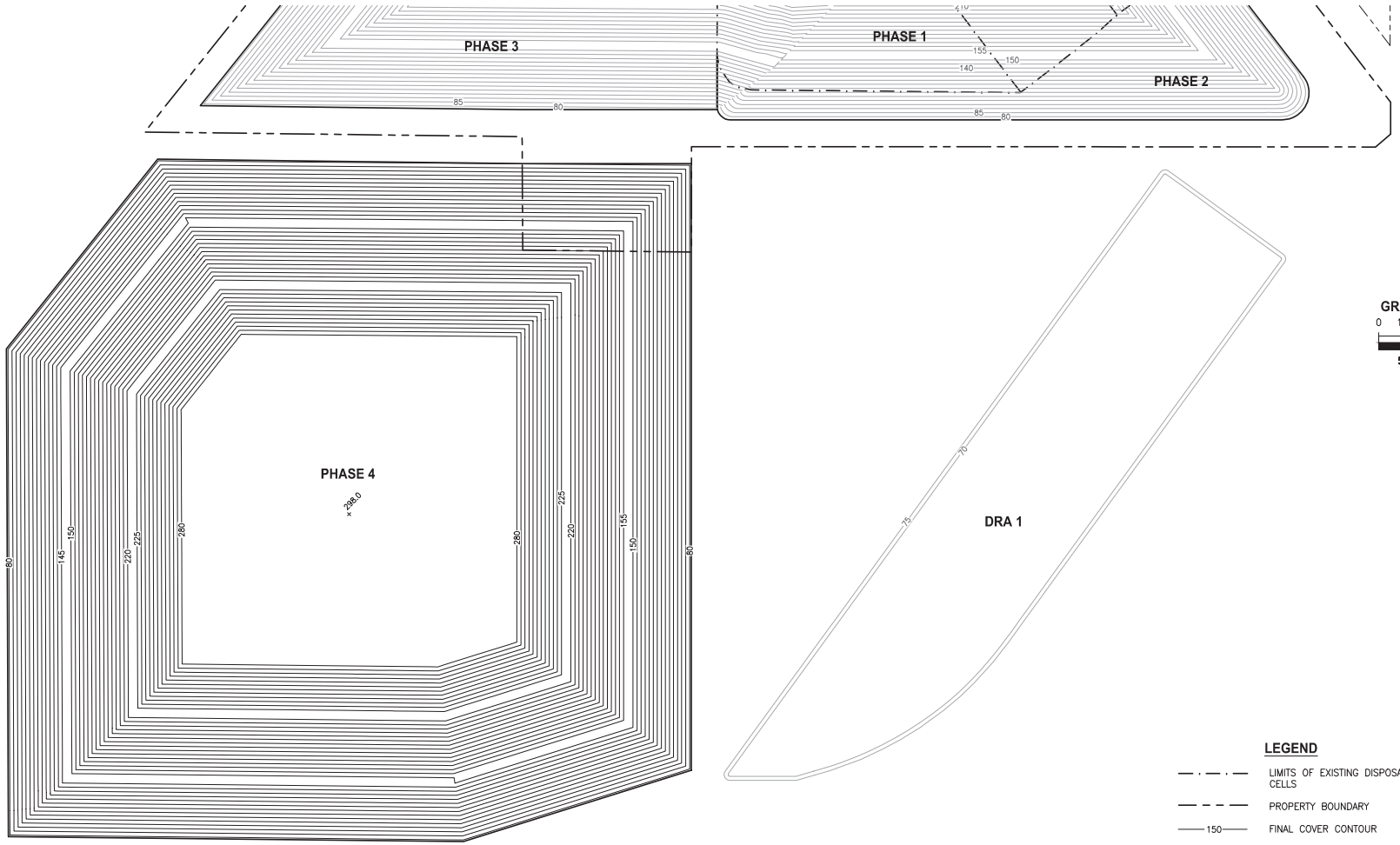


FIGURE 11
PHASE 4 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

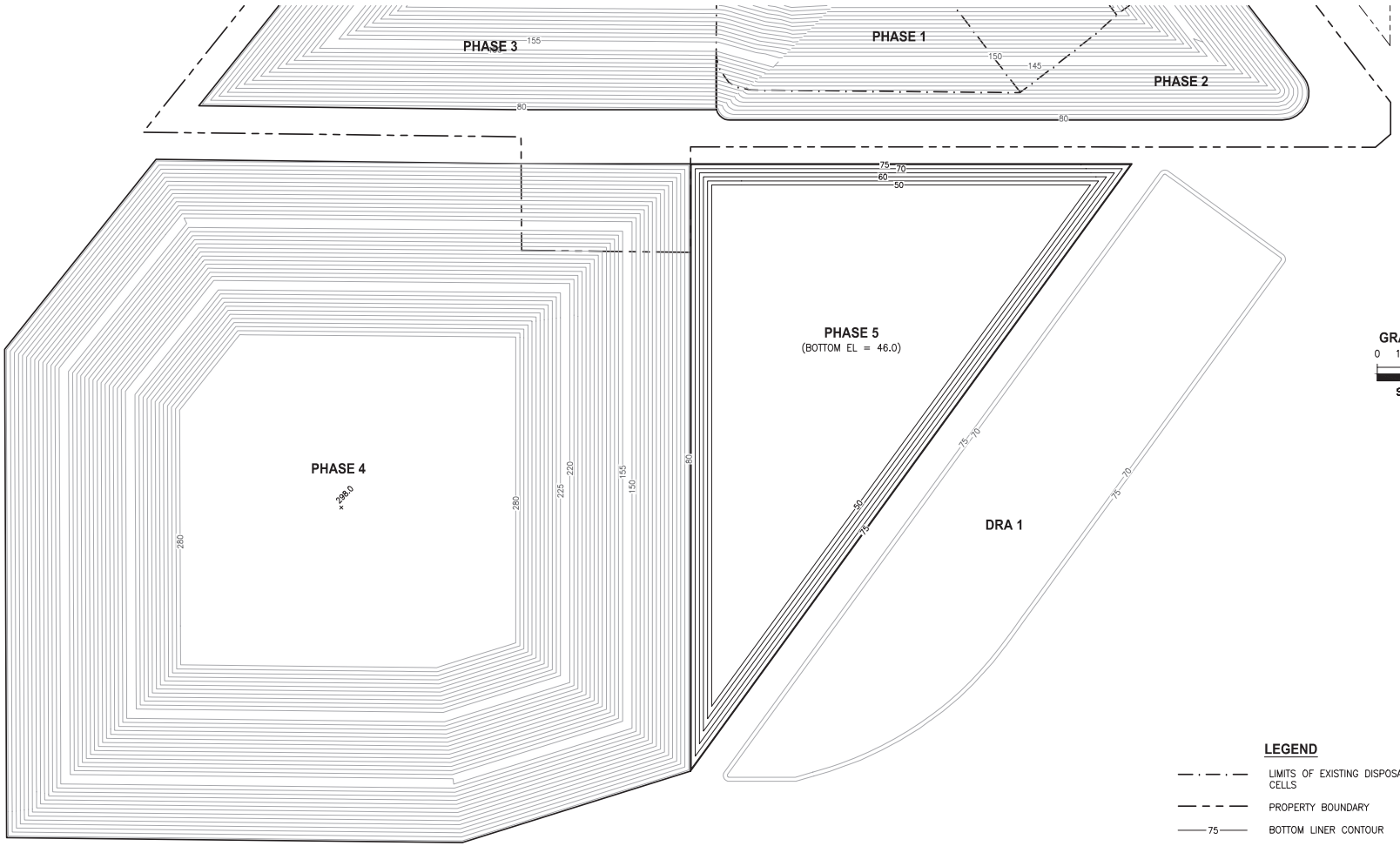


FIGURE 12
PHASE 5 BOTTOM LINER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

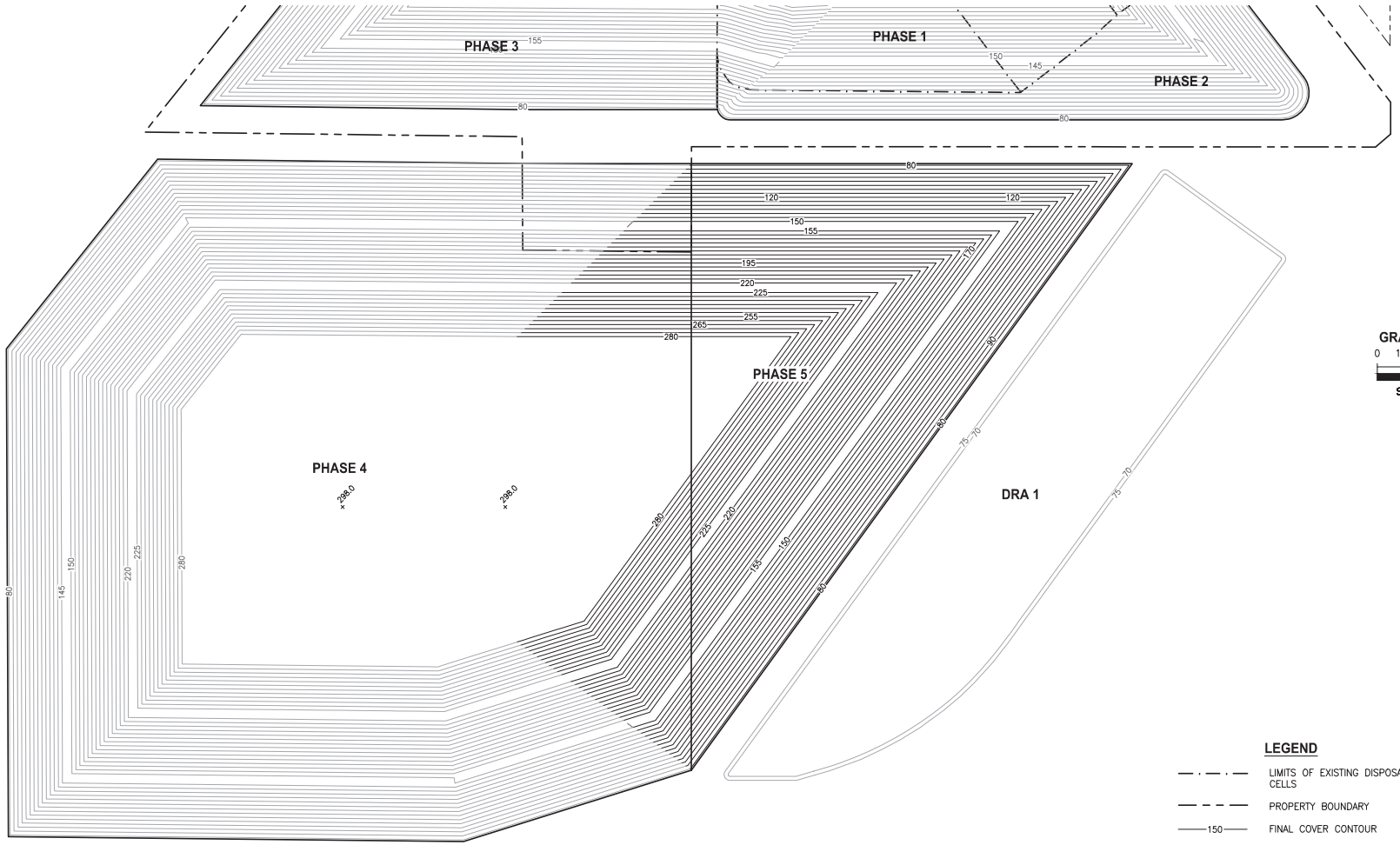
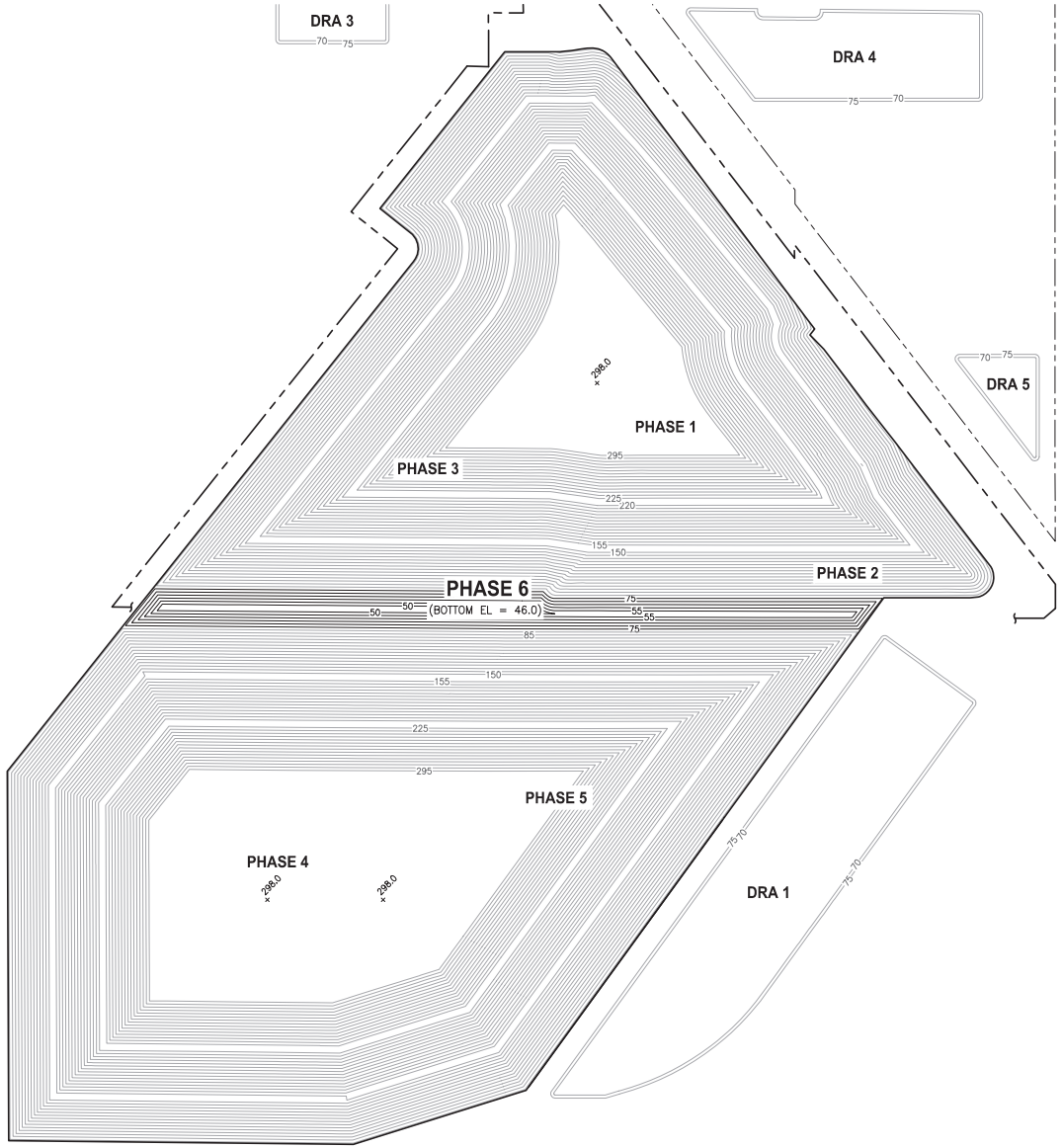


FIGURE 13
PHASE 5 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



N

GRAPHIC SCALE

0 150 300 600

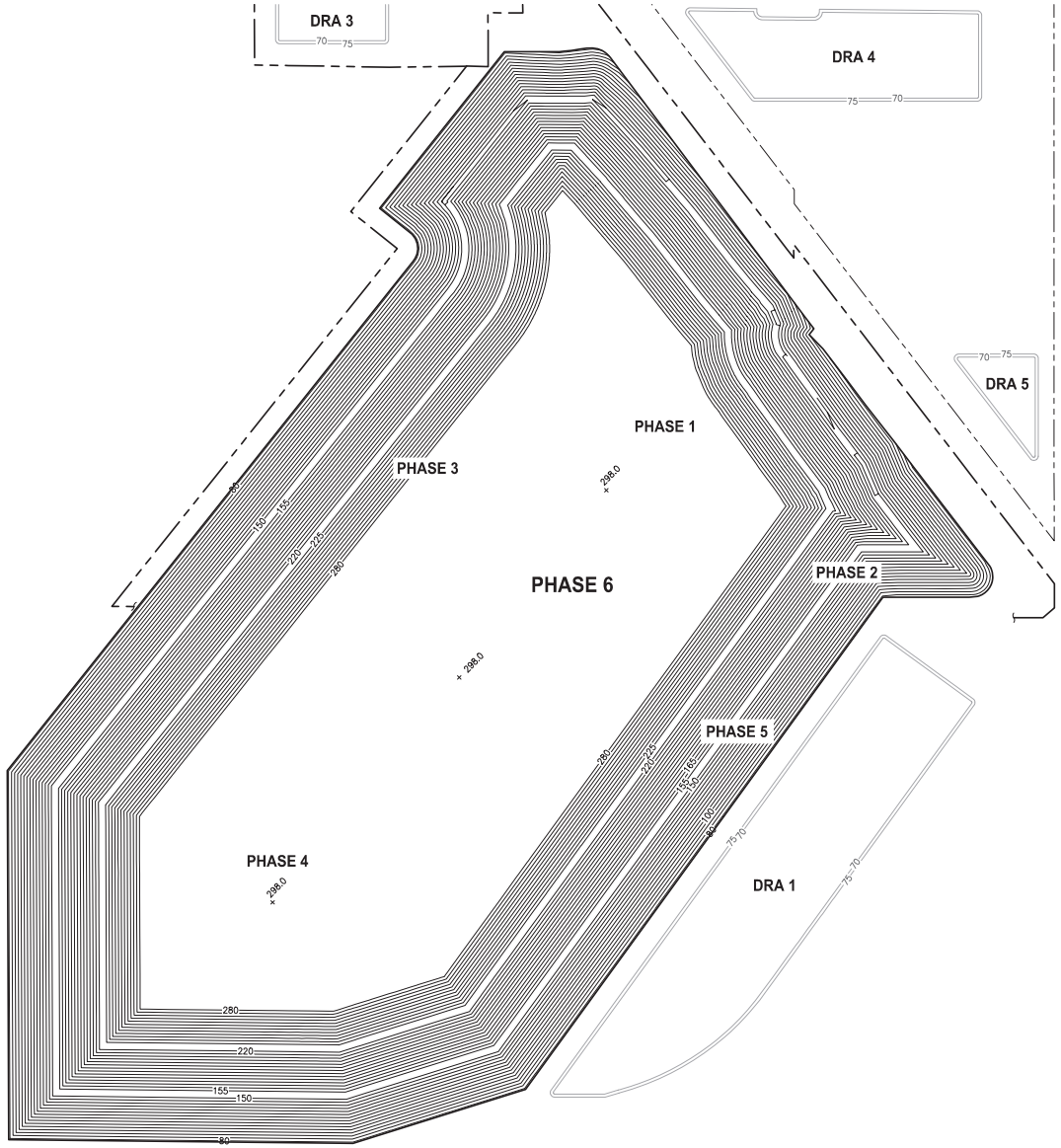
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 75 BOTTOM LINER CONTOUR
- 150 EXISTING GRADE CONTOUR

FIGURE 14
PHASE 6 BOTTOM LINER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds



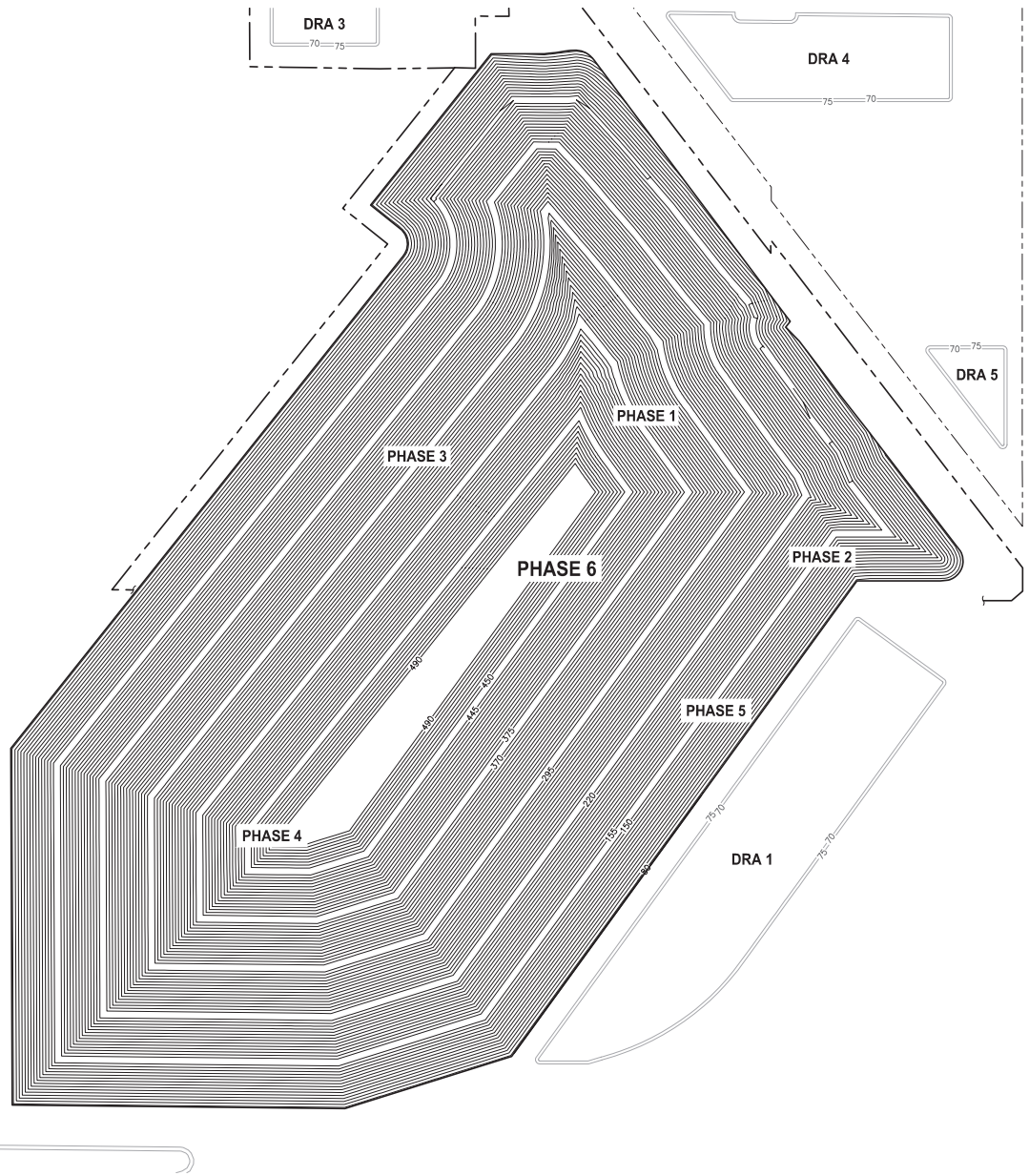
N

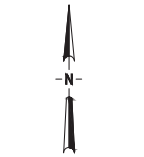
GRAPHIC SCALE
0 150 300 600
SCALE IN FEET

LEGEND
- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 150 FINAL COVER CONTOUR
- 75 EXISTING GRADE CONTOUR

FIGURE 15A
PHASE 6 CONCEPTUAL FINAL COVER
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds





LEGEND

- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 150 — FINAL COVER CONTOUR
- 75 — EXISTING GRADE CONTOUR

FIGURE 15B
GEOMETRIC BUILDOUT
BASELINE LANDFILL
MARION COUNTY, FLORIDA

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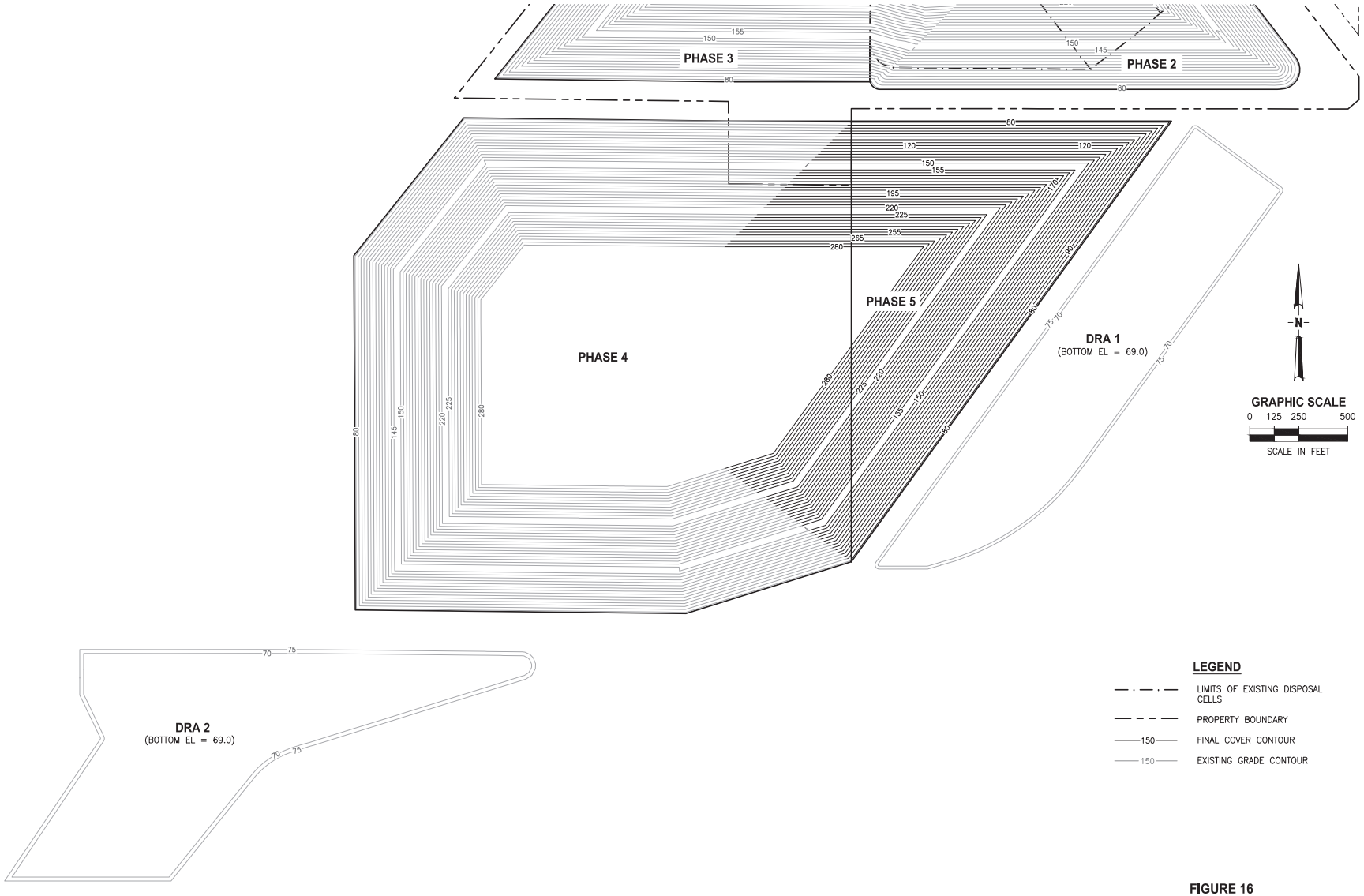

FIGURE 16
DRA 1 AND DRA 2
BASELINE LANDFILL
MARION COUNTY, FLORIDA

JonesEdmunds

N

GRAPHIC SCALE
0 100 200 400
SCALE IN FEET

LEGEND
- LIMITS OF EXISTING DISPOSAL CELLS
- PROPERTY BOUNDARY
- PROPERTY BOUNDARY (EAST PARCEL)
- 75 EXISTING GRADE CONTOUR

FIGURE 17
DRA 3, DRA 4, AND DRA 5
BASELINE LANDFILL
MARION COUNTY, FLORIDA

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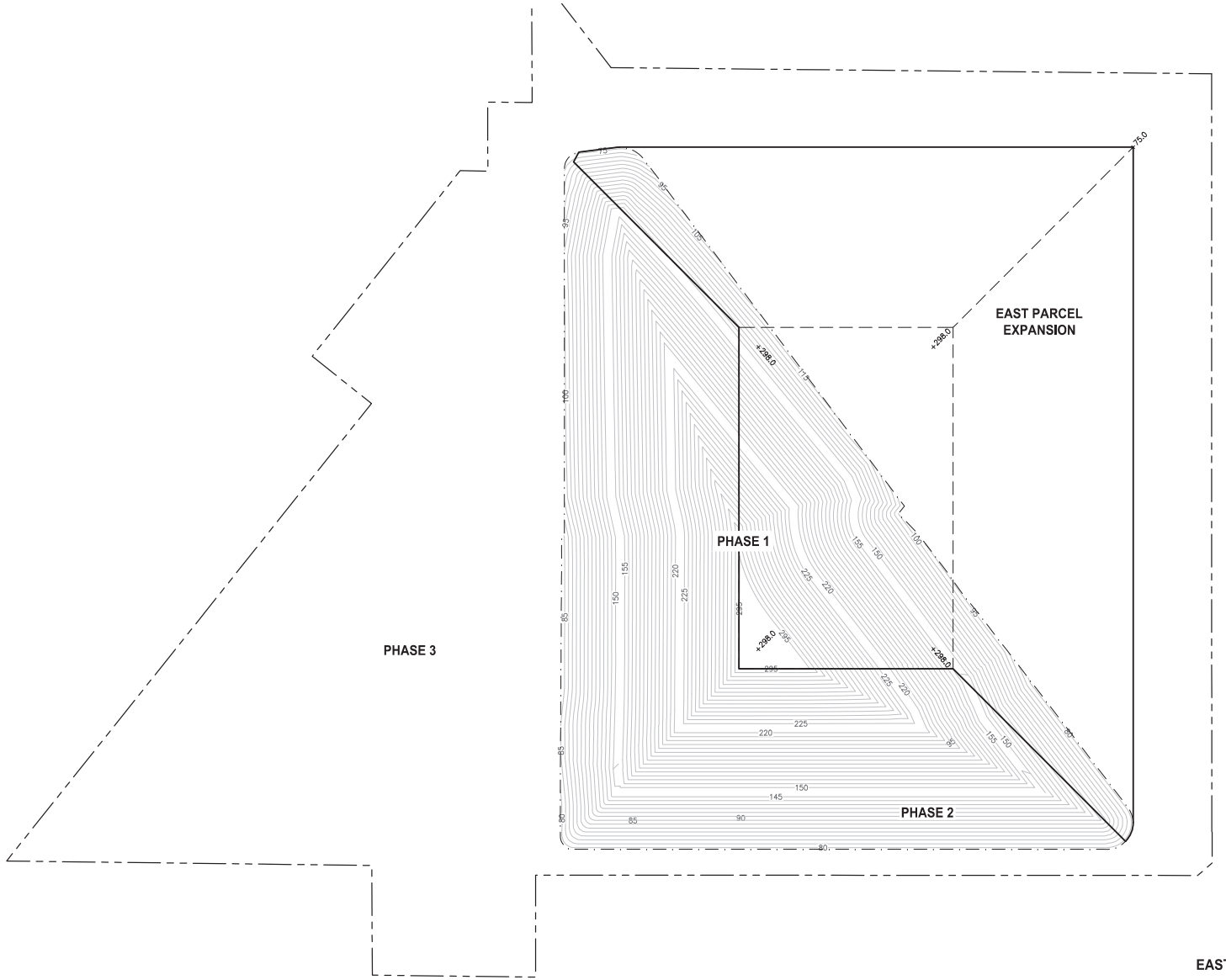

N

GRAPHIC SCALE
0 100 200 400
SCALE IN FEET

LEGEND
- PROPERTY BOUNDARY
- LIMITS OF DISPOSAL FOR EAST PARCEL EXPANSION
- GRADE BREAK
- LIMITS OF DISPOSAL FOR PHASE 1 AND PHASE 2
- 100 EXISTING GRADE CONTOUR

FIGURE 18
EAST PARCEL EXPANSION CONCEPTUAL LAYOUT
BASELINE LANDFILL
MARION COUNTY, FLORIDA

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Appendix A

Engineer's Opinion of Probable

Construction Cost

JonesEdmunds

PROJECT NUMBER: 13150-293-01
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phases 1 to 6
BY: M.Morse DATE: 7/17/2024
CHECKED: M.Deaderick DATE: 7/18/2024

Marion County Baseline Landfill
Site Master Planning
Cost Opinion Summary Sheet: Total Costs

Summary of Costs: Baseline Landfill Expansion

Landfill Phase	Area (acres)	Waste Volume (CY)	Cell Capacity (tons)	1.56% Growth Lifespan (years)	Replacement Cost (1)	Construction Cost	Construction Cost per Acre	Land Purchase Cost (2)	Closure Cost @ $363,000/acre	Landfill Operation Cost @ $15.00/ton (3)	Total Expansion Cost
Phase 1 - Urban Cell*	38	1,900,000	1,400,000	6.5	$ -	$ 11,100,000	$ 300,000	$ 4,200,000	$ 13,800,000	$ 21,000,000	$ 66,900,000
Phase 1 - Cell III	43					$ 4,000,000	$ 100,000		$ 15,600,000		
Phase 2	12	1,700,000	1,300,000	5.4	$ 17,500,000	$ 18,100,000	$ 1,500,000		$ 4,400,000	$ 19,500,000	$ 60,900,000
Phase 3	61	15,500,000	11,600,000	35.5	$ 1,700,000	$ 74,300,000	$ 1,200,000		$ 21,900,000	$ 174,000,000	$ 273,300,000
Onsite Subtotal	*154*	*19,100,000*	*14,300,000*	*47.4*	*$ 19,200,000*	*$ 107,500,000*		*$ 4,200,000*	*$ 55,700,000*	*$ 214,500,000*	*$ 401,100,000*
Phase 4	139	33,100,000	24,800,000	41.5	$ -	$ 171,100,000	$ 1,200,000		$ 50,500,000	$ 372,000,000	$ 600,500,000
Phase 5	42	8,100,000	6,100,000	7.1	$ -	$ 54,500,000	$ 1,300,000	$ 20,800,000	$ 15,200,000	$ 91,500,000	$ 168,100,000
Phase 6	15	17,800,000	13,400,000	13.3	$ -	$ 18,400,000	$ 1,200,000		$ 5,500,000	$ 201,000,000	$ 231,800,000
Offsite Subtotal	*196*	*59,000,000*	*44,300,000*	*61.9*	*$ -*	*$ 244,000,000*		*$ 20,800,000*	*$ 71,200,000*	*$ 664,500,000*	*$ 1,000,500,000*
Total	350	78,100,000	58,600,000	109	$ 19,200,000	$ 351,500,000		$ 25,000,000	$ 126,900,000	$ 879,000,000	$ 1,401,500,000

Summary of Total Cost: Out-of-County Disposal Cost

Landfill Phase	Transportation Cost @ $16.53/ton	Disposal Cost @ $30/ton	Transfer Station Operation Cost @ $11.81/ton (4)	Transfer Station Maintenance Cost (5)	Total Offsite Disposal Cost
Phase 1 - Urban Cell	$ 23,100,000	$ 42,000,000	$ 16,500,000	$ 1,300,000	$ 82,900,000
Phase 1 - Cell III					
Phase 2	$ 21,500,000	$ 39,000,000	$ 15,400,000	$ 1,100,000	$ 77,000,000
Phase 3	$ 191,700,000	$ 348,000,000	$ 137,000,000	$ 22,100,000	$ 698,800,000
Onsite Subtotal	*$ 236,400,000*	*$ 429,000,000*	*$ 168,900,000*	*$ 24,500,000*	*$ 858,800,000*
Phase 4	$ 409,900,000	$ 744,000,000	$ 292,900,000	$ 16,600,000	$ 1,463,400,000
Phase 5	$ 100,800,000	$ 183,000,000	$ 72,000,000	$ 2,800,000	$ 358,600,000
Phase 6	$ 221,500,000	$ 402,000,000	$ 158,300,000	$ 5,300,000	$ 787,100,000
Offsite Subtotal	*$ 732,300,000*	*$ 1,329,000,000*	*$ 523,200,000*	*$ 24,800,000*	*$ 2,609,300,000*
Total	$ 968,500,000	$ 1,758,000,000	$ 692,100,000	$ 49,200,000	$ 3,467,800,000

Total Cost Difference: Baseline Landfill Expansion Versus Hauling Offsite

Landfill Phase	Cost Difference
Phase 1 - Urban Cell	$ (16,000,000)
Phase 1 - Cell III	
Phase 2	$ (16,100,000)
Phase 3	$ (425,500,000)
Onsite Average	*$ (457,700,000)*
Phase 4	$ (862,900,000)
Phase 5	$ (190,500,000)
Phase 6	$ (555,300,000)
Offsite Average	*$ (1,608,800,000)*
Total	$ (2,066,300,000)

Notes:
(1) The Phase 2 Replacement Cost is for the East Parcel infrastructure that would be moved out of the Phase 2 footprint. This cost includes the development cost provided by Tillman in Appendix D.
(2) Land purchase cost is based on the purchase price per acre of the East Parcel. One third of the onsite purchase cost is allocated to Phases 1, 2, and 3; one third of the offsite purchase cost is allocated to Phases 4, 5, and 6. Actual land purchase prices should be evaluated by a real estate professional.
(3) Operation cost per ton based on calculations for "Budgetary Construction Cost Estimate - Landfill Operating Costs" provided at the end of the cost estimate.
(4) Transfer station operation cost per ton is based on the Stantec report (Solid Waste Financial Sustainability and Landfill Fee Analysis – Final Report. January 16, 2024.)
(5) Transfer station maintenance cost assumes an average of $2,000,000 maintenance required every 10 years. A new transfer station is projected before the annual tonnage acceptance rate reach 1,200 tons per day, adding an estimated $15,000,000 to the total transfer station cost during Phase 3. Following the construction of a second transfer station, the maintenance cost is assumed to be $4,000,000 every 10 years.

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 1 of 1
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phases 1 to 6
BY: M.Morse DATE: 7/17/2024
CHECKED: M.Deaderick DATE: 7/29/2024

Marion County Baseline Landfill
Site Master Planning
Cost Opinion Summary Sheet: Cost per Ton

Summary of Costs: Baseline Landfill Expansion

Landfill Phase	Area (acres)	Waste Volume (CY)	Cell Capacity (tons)	1.56% Growth Lifespan (years)	Replacement Cost per Ton (1)	Replacement Cost	Construction Cost per Ton	Land Purchase Cost per Ton (2)	Closure Cost per Ton (3)	Operation Cost per Ton (4)	Total Cost per Ton
Phase 1 - Urban Cell*	38	1,900,000	1,400,000	6.5	$ -	$ -	$ 10.79	$ 0.29	$ 21.00	$ 15.00	$ 47.08
Phase 1 - Cell III	43										
Phase 2	12	1,700,000	1,300,000	5.4	$ 13.46	$ 17,500,000	$ 13.92		$ 3.38	$ 15.00	$ 46.06
Phase 3	61	15,500,000	11,600,000	35.5	$ 0.15	$ 1,700,000	$ 6.41		$ 1.89	$ 15.00	$ 23.73
Onsite Subtotal	*154*	*19,100,000*	*14,300,000*	*47.4*	*$ 1.34*	*$ 19,200,000*	*$ 7.52*	*$ 0.29*	*$ 3.90*	*$ 15.00*	*$ 28.05*
Phase 4	139	33,100,000	24,800,000	41.5	$ -	$ -	$ 6.90		$ 2.04	$ 15.00	$ 24.41
Phase 5	42	8,100,000	6,100,000	7.1	$ -	$ -	$ 8.93	$ 0.47	$ 2.49	$ 15.00	$ 26.90
Phase 6	15	17,800,000	13,400,000	13.3	$ -	$ -	$ 1.37		$ 0.41	$ 15.00	$ 17.25
Offsite Subtotal	*196*	*59,000,000*	*44,300,000*	*61.9*	*$ -*	*$ -*	*$ 5.51*	*$ 0.47*	*$ 1.61*	*$ 15.00*	*$ 22.58*
Total	350	78,100,000	58,600,000	109.3	$ 0.33	$ 19,200,000	$ 6.00	$ 0.43	$ 2.17	$ 15.00	$ 23.92

Summary of Total Cost: Out-of-County Disposal Cost

Cell	Transportation Cost per Ton	Offsite Disposal Cost per Ton	Transfer Station Operation Cost per Ton (5)	Transfer Station Maintenance Cost per Ton (6)	Total Offsite Disposal Cost per Ton
Phase 1 - Urban Cell	$ 16.53	$ 30	$ 11.81	$ 0.93	$ 59.27
Phase 1 - Cell III					
Phase 2	$ 16.53	$ 30	$ 11.81	$ 0.83	$ 59.17
Phase 3	$ 16.53	$ 30	$ 11.81	$ 1.91	$ 60.25
Onsite Subtotal	*$ 16.53*	*$ 30*	*$ 11.81*	*$ 1.71*	*$ 60.05*
Phase 4	$ 16.53	$ 30	$ 11.81	$ 0.67	$ 59.01
Phase 5	$ 16.53	$ 30	$ 11.81	$ 0.47	$ 58.81
Phase 6	$ 16.53	$ 30	$ 11.81	$ 0.40	$ 58.74
Offsite Subtotal	*$ 16.53*	*$ 30*	*$ 11.81*	*$ 0.56*	*$ 58.90*
Overal Average	$ 16.53	$ 30	$ 11.81	$ 0.84	$ 59.18

Cost per Ton Difference: Baseline Landfill Expansion Versus Hauling Offsite

Cell	Cost Difference per Ton
Phase 1 - Urban Cell	$ (12.19)
Phase 1 - Cell III	
Phase 2	$ (13.11)
Phase 3	$ (36.51)
Onsite Average	*$ (32.00)*
Phase 4	$ (34.60)
Phase 5	$ (31.91)
Phase 6	$ (41.48)
Offsite Average	*$ (36.31)*
Overall Average	$ (35.26)

Notes:
(1) The Phase 2 Replacement Cost is for the East Parcel infrastructure that would be moved out of the Phase 2 footprint. This cost includes the development cost provided by Tillman in Appendix D.
(2) Land purchase cost was not included in this analysis but will need to be included for off-site landfill phases if more detailed cost estimates are performed.
(3) The Closure Cost per Ton of Phase 1 is significantly higher than other phases because Phase 1 has a relatively small amount of waste capacity compared to a large surface area that requires closure.
(4) Operation cost per ton based on calculations for "Budgetary Construction Cost Estimate - Landfill Operating Costs" provided at the end of this cost estimate.
(5) Transfer station operation cost per ton is based on the Stantec report (Solid Waste Financial Sustainability and Landfill Fee Analysis – Final Report. January 16, 2024.)
(6) Transfer station maintenance cost assumes an average of $2,000,000 maintenance required every 10 years. A new transfer station is projected before the annual tonnage acceptance rate reach 1,200 tons per day, adding an estimated $15,000,000 to the total transfer station cost during that phase. Following the construction of a second transfer station, the maintenance cost is assumed to be $4,000,000 every 10 years.

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 3
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 1: Urban Cell
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 1: Urban Cell

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 483,000	$ 483,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
3	Construction Surveying and Record Drawings	LS	1	$ 303,000	$ 303,000	
4	Waste Relocation	LS	1	$ 991,000	$ 991,000	
5	Anchor Trench	LS	1	$ 74,000	$ 74,000	
6	Bedding Soil	LS	1	$ 1,771,000	$ 1,771,000	
7	Geogrid	LS	1	$ 361,000	$ 361,000	
8	Secondary Geomembrane	LS	1	$ 327,000	$ 327,000	
9	Secondary Geocomposite	LS	1	$ 390,000	$ 390,000	
10	Primary Geomembrane	LS	1	$ 327,000	$ 327,000	
11	Primary Geocomposite	LS	1	$ 390,000	$ 390,000	
12	Leak Detection and Leachate Collection Trenches	LS	1	$ 510,000	$ 510,000	
13	Drainage Soil	LS	1	$ 1,771,000	$ 1,771,000	
14	Rain Tarp	LS	1	$ 226,000	$ 226,000	
15	Pump Stations	LS	1	$ 863,000	$ 863,000	
16	Leachate Force Main	LS	1	$ 75,000	$ 75,000	
17	Gas Collection and Control System	LS	1	$ 646,000	$ 646,000	
Subtotal Base Bid					**$ 9,668,000**	
Contingency Allowance Base Bid (15%)					**$ 1,450,000**	
Total Bid					**$11,118,000**	

Development Assumptions

Landfill Area =	38.0	acres
No. of Collection Trenches =	1	
No. of Pumps Stations =	1	

Subtotal Contract Amount	**$ 9,668,000**		
Landfill Unit Cost Without Contingency ($/acre)	**$ 254,421**		
Contingency (15%)	**$ 1,450,000**		
Total Contract Amount	**$ 11,118,000**		
Landfill Unit Cost ($/acre)	**$ 292,579**		
Total Cost Range	**$ 9,700,000**	**To**	**$ 11,100,000**
Cost Per Acre Range	**$ 250,000**	**To**	**$ 290,000**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 2 of 3
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 1: Urban Cell
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 483,000	$ 483,000	*Max 5% of Contract*
	Total Contract Sum = $ 9,185,000					
1.1	Mobilization				$ 96,684	20%
1.2	Demobilization				$ 72,513	15%
1.3	Administration				$ 48,342	10%
1.4	Bonds				$ 48,342	10%
1.5	Insurance				$ 48,342	10%
1.6	Indemnification				$ 24,171	5%
1.7	Health and Safety				$ 24,171	5%
1.8	Field Offices/Temporary Utilities				$ 48,342	10%
1.9	Construction Permits				$ 24,171	5%
1.10	Submittals				$ 48,342	10%
	Subtotal Mobilization and Demobilization				*$ 483,421*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
2.1	Environmental Protection	LS	1	$ 160,000.00	$ 160,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 160,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 303,000	$ 303,000	
3.1	Construction Surveying and Record Drawings	AC	38	$ 7,968.20	$ 302,792	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 302,792*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Waste Relocation	LS	1	$ 991,000	$ 991,000	
4.1	Excavation to Backfill	CY	157,000	$ 6.00	$ 942,000	*T&K 2023 Bid*
4.2	Compaction	SY	99,000	$ 0.49	$ 48,510.00	*RSMeans Item 312323235100*
	Subtotal Waste Relocation				*$ 990,510*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Anchor Trench	LS	1	$ 74,000	$ 74,000	
5.1	Anchor Trench Construction	LF	3,000	$ 24.50	$ 73,507	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 73,507*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Bedding Soil	LS	1	$ 1,771,000	$ 1,771,000	
6.1	Soil Material	CY	43,000	$ 37.31	$ 1,604,330	*FDOT Statewide 0120 2 2*
6.2	Grading	SY	52,000	$ 1.26	$ 65,520	*RSMeans Item 312216101020*
6.3	Spreading	CY	43,000	$ 2.35	$ 101,050	*RSMeans Item 312323170020*
	Subtotal Bedding Soil				*$ 1,770,900*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Geogrid	LS	1	$ 361,000	$ 361,000	
7.1	Secondary Geomembrane Material and Installation	SF	469,000	$ 0.77	$ 361,130	*Agru Quote September 2023*
	Subtotal Geogrid				*$ 361,130*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Secondary Geomembrane	LS	1	$ 327,000	$ 327,000	
8.1	Secondary Geomembrane Material and Installation	SF	526,000	$ 0.62	$ 326,700	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 326,700*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Secondary Geocomposite	LS	1	$ 390,000	$ 390,000	
9.1	Secondary Geocomposite Material and Installation	SF	526,000	$ 0.74	$ 390,100	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 390,100*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 3
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 1: Urban Cell
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Primary Geomembrane	LS	1	$ 327,000	$ 327,000	
10.1	Primary Geomembrane Material and Installation	SF	526,000	$ 0.62	$ 326,700	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 326,700*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Primary Geocomposite	LS	1	$ 390,000	$ 390,000	
11.1	Primary Geocomposite Material and Installation	SF	526,000	$ 0.74	$ 390,100	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 390,100*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Leak Detection and Leachate Collection Trenches	LS	1	$ 510,000	$ 510,000	
12.1	Trenches and Sump	LF	1,200	$ 425	$ 509,528	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 509,528*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Drainage Soil	LS	1	$ 1,771,000	$ 1,771,000	
13.1	Soil Material	CY	43,000	$ 37.31	$ 1,604,330	*FDOT Statewide 0120 2 2*
13.2	Grading	SY	52,000	$ 1.26	$ 65,520	*RSMeans Item 312216101020*
13.3	Spreading	CY	43,000	$ 2.35	$ 101,050	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 1,770,900*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Rain Tarp	LS	1	$ 226,000	$ 226,000	
14.1	Rain Tarp Material and Installation	SF	526,000	$ 0.43	$ 226,024	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 226,024*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Pump Stations	LS	1	$ 863,000	$ 863,000	
15.1	Leachate Pump Station	EA	1	$ 862,500.00	$ 862,500	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 862,500*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Leachate Force Main	LS	1	$ 75,000	$ 75,000	
16.1	6-inch SDR 11 Material and Installation	LF	3,000	$ 15.56	$ 46,680	*RSMeans 333111203020, x2 for installation*
16.2	Leachate Force Main Trench	CY	3000	$ 6.00	$ 18,000	*T&K 2023 Bid*
16.3	Miscellaneous fittings and valves	LS	1	$ 10,000.00	$ 10,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 74,680*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Gas Collection and Control System	LS	1	$ 646,000	$ 646,000	
17.1	Gas Collection and Control System	AC	38	$ 17,000.00	$ 646,000	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 646,000*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 2
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 1: Cell III
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 1: Cell III

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 172,000	$ 172,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
3	Construction Surveying and Record Drawings	LS	1	$ 343,000	$ 343,000	
4	Waste Relocation	LS	1	$ 2,040,000	$ 2,040,000	
5	Gas Collection and Control System	LS	1	$ 731,000	$ 731,000	
Subtotal Base Bid					**$ 3,446,000**	
Contingency Allowance Base Bid (15%)					**$ 517,000**	
Total Bid					**$ 3,963,000**	

Development Assumptions

Landfill Area =	43.0	acres
No. of Collection Trenches =	1	
No. of Pumps Stations =	1	

Subtotal Contract Amount	**$ 3,446,000**		
Landfill Unit Cost Without Contingency ($/acre)	**$ 80,140**		
Contingency (15%)	**$ 517,000**		
Total Contract Amount	**$ 3,963,000**		
Landfill Unit Cost ($/acre)	**$ 92,163**		
Total Cost Range	**$ 3,400,000**	**To**	**$ 4,000,000**
Cost Per Acre Range	**$ 80,000**	**To**	**$ 90,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 2
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 1: Cell III
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 172,000	$ 172,000	*Max 5% of Contract*
	Total Contract Sum = $ 3,274,000					
1.1	Mobilization				$ 34,463	20%
1.2	Demobilization				$ 25,847	15%
1.3	Administration				$ 17,232	10%
1.4	Bonds				$ 17,232	10%
1.5	Insurance				$ 17,232	10%
1.6	Indemnification				$ 8,616	5%
1.7	Health and Safety				$ 8,616	5%
1.8	Field Offices/Temporary Utilities				$ 17,232	10%
1.9	Construction Permits				$ 8,616	5%
1.10	Submittals				$ 17,232	10%
	Subtotal Mobilization and Demobilization				*$ 172,316*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
2.1	Environmental Protection	LS	1	$ 160,000	$ 160,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 160,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 343,000	$ 343,000	
3.1	Construction Surveying and Record Drawings	AC	43	$ 7,968	$ 342,633	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 342,633*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Waste Relocation	LS	1	$ 2,040,000	$ 2,040,000	
4.1	Excavation to Backfill	CY	340,000	$ 6.00	$ 2,040,000	*T&K 2023 Bid*
4.2	Compaction	SY	222,000	$ 0.49	$ 108,780.00	*RSMeans Item 312323235100*
	Subtotal Waste Relocation				*$ 2,040,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Gas Collection and Control System	LS	1	$ 731,000	$ 731,000	
5.1	Gas Collection and Control System	AC	43	$ 17,000.00	$ 731,000	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 731,000*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 2
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 2

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 785,000	$ 785,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
3	Construction Surveying and Record Drawings	LS	1	$ 96,000	$ 96,000	
4	Clearing, Grubbing, and Stripping	LS	1	$ 91,000	$ 91,000	
5	Demolition	LS	1	$ 37,000	$ 37,000	
6	Stormwater System	LS	1	$ 105,000	$ 105,000	
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 2,652,000	$ 2,652,000	
8	Earthwork - Soil-to-Fill	LS	1	$ 110,000	$ 110,000	
9	Anchor Trench	LS	1	$ 76,000	$ 76,000	
10	Geosynthetic Clay Liner	LS	1	$ 416,000	$ 416,000	
11	Secondary Geomembrane	LS	1	$ 365,000	$ 365,000	
12	Secondary Geocomposite	LS	1	$ 436,000	$ 436,000	
13	Primary Geomembrane	LS	1	$ 365,000	$ 365,000	
14	Primary Geocomposite	LS	1	$ 436,000	$ 436,000	
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 314,000	$ 314,000	
16	Drainage Soil	LS	1	$ 2,016,000	$ 2,016,000	
17	Rain Tarp	LS	1	$ 253,000	$ 253,000	
18	Pump Stations	LS	1	$ 3,450,000	$ 3,450,000	
19	Leachate Force Main	LS	1	$ 27,000	$ 27,000	
20	Seeding and Sodding	LS	1	$ 148,000	$ 148,000	
21	Groundwater Monitoring Well Modifications	LS	1	$ 11,000	$ 11,000	
22	Paved and Unpaved Site Roads	LS	1	$ 532,000	$ 532,000	
23	Karst Foundation Upgrades	LS	1	$ 2,614,000	$ 2,614,000	
24	Gas Collection and Control System	LS	1	$ 205,000	$ 205,000	
Subtotal Base Bid					**$15,700,000**	
Contingency Allowance Base Bid (15%)					**$ 2,355,000**	
Total Bid					**$18,055,000**	

Development Assumptions

Landfill Area =	12.0	acres
No. of Collection Trenches =	1	
No. of Pumps Stations =	1	

Subtotal Contract Amount			**$ 15,700,000**
Landfill Unit Cost Without Contingency ($/acre)			**$ 1,303,313**
Contingency (15%)			**$ 2,355,000**
Total Contract Amount			**$ 18,055,000**
Landfill Unit Cost ($/acre)			**$ 1,498,810**
Total Cost Range	**$ 15,700,000**	**To**	**$ 18,100,000**
Cost Per Acre Range	**$ 1,300,000**	**To**	**$ 1,500,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 2
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 785,000	$ 785,000	*Max 5% of Contract*
	Total Contract Sum = $ 14,915,000					
1.1	Mobilization				$ 157,000	20%
1.2	Demobilization				$ 117,750	15%
1.3	Administration				$ 78,500	10%
1.4	Bonds				$ 78,500	10%
1.5	Insurance				$ 78,500	10%
1.6	Indemnification				$ 39,250	5%
1.7	Health and Safety				$ 39,250	5%
1.8	Field Offices/Temporary Utilities				$ 78,500	10%
1.9	Construction Permits				$ 39,250	5%
1.10	Submittals				$ 78,500	10%
	Subtotal Mobilization and Demobilization				*$ 785,000*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 160,000	$ 160,000	
2.1	Environmental Protection	LS	1	$ 160,000.00	$ 160,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 160,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 96,000	$ 96,000	
3.1	Construction Surveying and Record Drawings	AC	12	$ 7,968.20	$ 95,987	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 95,987*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Clearing, Grubbing, and Stripping	LS	1	$ 91,000	$ 91,000	
4.1	Clearing, Grubbing, and Stripping	AC	12	$ 7,555.04	$ 91,010	*Comanco 2024 Bid*
	Subtotal Clearing, Grubbing, and Stripping				*$ 91,010*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Demolition	LS	1	$ 37,000	$ 37,000	
5.1	Miscellaneous	AC	12	$ 3,039.72	$ 36,617	*Comanco 2024 Bid*
	Subtotal Demolition				*$ 36,617*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Stormwater System	LS	1	$ 105,000.00	$ 105,000	
6.1	36-inch RCP	LF	240	$ 177.15	$ 42,516	*RSMeans 334211602060*
6.2	36-inch MES	EA	6	$ 8,923.61	$ 53,542	*FDOT 0430982138*
6.3	Rip-rap	TON	47	$ 189.32	$ 8,835	*FDOT 0530 3 4*
	Subtotal Stormwater System				*$ 104,893*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 2
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 2,652,000	$ 2,652,000	
7.1	Subgrade Excavation to Stockpile	CY	442,000	$ 6.00	$ 2,652,000	*T&K 2023 Bid*
	Subtotal Earthwork - Subgrade Excavation Cut-to-Fill				*$ 2,652,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Earthwork - Soil-to-Fill	LS	1	$ 110,000	$ 110,000	
8.1	Grading	SY	58,000	$ 1.26	$ 73,080.00	*RSMeans Item 312216101020*
8.2	Spreading	CY	13,000	$ 2.35	$ 30,550.00	*RSMeans Item 312323170020*
8.3	Compaction	CY	13,000	$ 0.49	$ 6,370.00	*RSMeans Item 312323235100*
	Subtotal Earthwork - Soil-to-Fill				*$ 110,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Anchor Trench	LS	1	$ 76,000	$ 76,000	
9.1	Anchor Trench Construction	LF	3,100	$ 24.50	$ 75,957	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 75,957*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Geosynthetic Clay Liner	LS	1	$ 416,000	$ 416,000	
10.1	GCL Material and Installation	SF	588,000	$ 0.71	$ 416,097	*Agru Quote September 2023*
	Subtotal Geosynthetic Clay Liner				*$ 416,097*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Secondary Geomembrane	LS	1	$ 365,000	$ 365,000	
11.1	Secondary Geomembrane Material and Installation	SF	588,000	$ 0.62	$ 365,208	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 365,208*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Secondary Geocomposite	LS	1	$ 436,000	$ 436,000	
12.1	Secondary Geocomposite Material and Installation	SF	588,000	$ 0.74	$ 436,081	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 436,081*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Primary Geomembrane	LS	1	$ 365,000	$ 365,000	
13.1	Primary Geomembrane Material and Installation	SF	588,000	$ 0.62	$ 365,208	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 365,208*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Primary Geocomposite	LS	1	$ 436,000	$ 436,000	
14.1	Primary Geocomposite Material and Installation	SF	588,000	$ 0.74	$ 436,081	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 436,081*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 314,000	$ 314,000	
15.1	Trenches and Sump	LF	740	$ 425	$ 314,209	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 314,209*	

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PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 2
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Drainage Soil	LS	1	$ 2,016,000	$ 2,016,000	
16.1	Soil Material	CY	49,000	$ 37.31	$ 1,828,190	*FDOT Statewide 0120 2 2*
16.2	Grading	SY	58,000	$ 1.26	$ 73,080	*RSMeans Item 312216101020*
16.3	Spreading	CY	49,000	$ 2.35	$ 115,150	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 2,016,420*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Rain Tarp	LS	1	$ 253,000	$ 253,000	
17.1	Rain Tarp Material and Installation	SF	588,000	$ 0.43	$ 252,666	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 252,666*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
18	Pump Stations	LS	1	$ 3,450,000	$ 3,450,000	
18.1	Leachate Pump Station	EA	4	$ 862,500.00	$ 3,450,000	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 3,450,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
19	Leachate Force Main	LS	1	$ 27,000	$ 27,000	
19.1	6-inch SDR 11 Material and Installation	LF	800	$ 15.56	$ 12,448	*RSMeans 333111203020, x2 for installation*
19.2	Leachate Force Main Trench	CY	700	$ 6.00	$ 4,200	*T&K 2023 Bid*
19.3	Miscellaneous fittings and valves	LS	1	$ 10,000.00	$ 10,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 26,648*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
20	Seeding and Sodding	LS	1	$ 148,000	$ 148,000	
20.1	Seeding (Assumed 4 Acres)	SY	19,000	$ 3.19	$ 60,610	*FDOT 0570 1 1*
20.2	Sodding (Assumed 4 Acres)	SY	19,000	$ 4.60	$ 87,400	*FDOT 0570 1 2*
	Subtotal Seeding and Sodding				*$ 148,010*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
21	Groundwater Monitoring Well Modifications	LS	1	$ 11,000	$ 11,000	
21.1	Groundwater and Gas Well Installation and Abandonment	LS	1	$ 10,750.00	$ 10,750	*Preferred Drilling Quote May 2023*
	Subtotal Groundwater Monitoring Well Modifications				*$ 10,750*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
22	Paved and Unpaved Site Roads	LS	1	$ 532,000	$ 532,000	
22.1	Limerock Roads	SF	75,000	$ 7.09	$ 531,853	*T&K 2023 Bid*
	Subtotal Paved and Unpaved Site Roads				*$ 531,853*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
23	Karst Foundation Upgrades	LS	1	$ 2,614,000	$ 2,614,000	
23.1	Site-specific Hydrogeological Upgrades	AC	12	$ 217,000.00	$ 2,614,031	*Geohazards Estimate*
	Subtotal Karst Foundation Upgrades				*$ 2,614,031*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
24	Gas Collection and Control System	LS	1	$ 205,000	$ 205,000	
24.1	Gas Collection and Control System	AC	12	$ 17,000.00	$ 204,786	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 204,786*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 3
BY: M.Morse DATE: 3/28/2024
CHECKED: R. Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 3

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 3,231,000	$ 3,231,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 640,000	$ 640,000	
3	Construction Surveying and Record Drawings	LS	1	$ 482,000	$ 482,000	
4	Clearing, Grubbing, and Stripping	LS	1	$ 457,000	$ 457,000	
5	Demolition	LS	1	$ 184,000	$ 184,000	
6	Stormwater System	LS	1	$ 210,000	$ 210,000	
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 16,536,000	$ 16,536,000	
8	Earthwork - Soil-to-Fill	LS	1	$ 429,000	$ 429,000	
9	Anchor Trench	LS	1	$ 127,000	$ 127,000	
10	Geosynthetic Clay Liner	LS	1	$ 2,090,000	$ 2,090,000	
11	Secondary Geomembrane	LS	1	$ 2,112,000	$ 2,112,000	
12	Secondary Geocomposite	LS	1	$ 2,522,000	$ 2,522,000	
13	Primary Geomembrane	LS	1	$ 2,112,000	$ 2,112,000	
14	Primary Geocomposite	LS	1	$ 2,522,000	$ 2,522,000	
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 1,274,000	$ 1,274,000	
16	Drainage Soil	LS	1	$ 10,046,000	$ 10,046,000	
17	Rain Tarp	LS	1	$ 1,461,000	$ 1,461,000	
18	Pump Stations	LS	1	$ 2,588,000	$ 2,588,000	
19	Leachate Force Main	LS	1	$ 140,000	$ 140,000	
20	Seeding and Sodding	LS	1	$ 377,000	$ 377,000	
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
22	Paved and Unpaved Site Roads	LS	1	$ 901,000	$ 901,000	
23	Karst Foundation Upgrades	LS	1	$ 13,133,000	$ 13,133,000	
24	Gas Collection and Control System	LS	1	$ 1,029,000	$ 1,029,000	
Subtotal Base Bid					**$64,624,000**	
Contingency Allowance Base Bid (15%)					**$ 9,694,000**	
Total Bid					**$74,318,000**	

Development Assumptions

Landfill Area =	60.5	acres
No. of Collection Trenches =	3	
No. of Pumps Stations =	3	

Subtotal Contract Amount			**$ 64,624,000**
Landfill Unit Cost Without Contingency ($/acre)			**$ 1,067,771**
Contingency (15%)			**$ 9,694,000**
Total Contract Amount			**$ 74,318,000**
Landfill Unit Cost ($/acre)			**$ 1,227,944**
Total Cost Range	**$ 64,600,000**	To	**$ 74,300,000**
Cost Per Acre Range	**$ 1,070,000**	To	**$ 1,230,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 3
BY: M.Morse DATE: 3/28/2024
CHECKED: R. Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 3,231,000	$ 3,231,000	*Max 5% of Contract*
	Total Contract Sum = $ 61,393,000					
1.1	Mobilization				$ 646,242	20%
1.2	Demobilization				$ 484,682	15%
1.3	Administration				$ 323,121	10%
1.4	Bonds				$ 323,121	10%
1.5	Insurance				$ 323,121	10%
1.6	Indemnification				$ 161,561	5%
1.7	Health and Safety				$ 161,561	5%
1.8	Field Offices/Temporary Utilities				$ 323,121	10%
1.9	Construction Permits				$ 161,561	5%
1.10	Submittals				$ 323,121	10%
	Subtotal Mobilization and Demobilization				*$ 3,231,211*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 640,000	$ 640,000	
2.1	Environmental Protection	LS	1	$ 640,000.00	$ 640,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 640,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 482,000	$ 482,000	
3.1	Construction Surveying and Record Drawings	AC	61	$ 7,968.20	$ 482,254	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 482,254*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Clearing, Grubbing, and Stripping	LS	1	$ 457,000	$ 457,000	
4.1	Clearing, Grubbing, and Stripping	AC	61	$ 7,555.04	$ 457,248	*Comanco 2024 Bid*
	Subtotal Clearing, Grubbing, and Stripping				*$ 457,248*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Demolition	LS	1	$ 184,000	$ 184,000	
5.1	Miscellaneous	AC	61	$ 3,039.72	$ 183,971	*Comanco 2024 Bid*
	Subtotal Demolition				*$ 183,971*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Stormwater System	LS	1	$ 210,000.00	$ 210,000	
6.1	36-inch RCP	LF	480	$ 177.15	$ 85,032	*RSMeans 334211602060*
6.2	36-inch MES	EA	12	$ 8,923.61	$ 107,083	*FDOT 0430982138*
6.3	Rip-rap	TON	93	$ 189.32	$ 17,670	*FDOT 0530 3 4*
	Subtotal Stormwater System				*$ 209,785*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 3
BY: M.Morse DATE: 3/28/2024
CHECKED: R. Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 16,536,000	$ 16,536,000	
7.1	Subgrade Excavation to Stockpile and Backfill	CY	2,439,000	$ 6.00	$ 14,634,000	*T&K 2023 Bid*
7.2	Excavate DRAs 3, 4, and 5	CY	317,000	$ 6.00	$ 1,902,000	*T&K 2023 Bid*
	Subtotal Earthwork - Subgrade Excavation Cut-to-Fill				*$ 16,536,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Earthwork - Soil-to-Fill	LS	1	$ 429,000	$ 429,000	
8.1	Grading	SY	293,000	$ 1.26	$ 369,180.00	*RSMeans Item 312216101020*
8.2	Spreading	CY	21,000	$ 2.35	$ 49,350.00	*RSMeans Item 312323170020*
8.3	Compaction	CY	21,000	$ 0.49	$ 10,290.00	*RSMeans Item 312323235100*
	Subtotal Earthwork - Soil-to-Fill				*$ 428,820*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Anchor Trench	LS	1	$ 127,000	$ 127,000	
9.1	Anchor Trench Construction	LF	5,200	$ 24.50	$ 127,411	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 127,411*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Geosynthetic Clay Liner	LS	1	$ 2,090,000	$ 2,090,000	
10.1	GCL Material and Installation	SF	2,953,000	$ 0.71	$ 2,089,684	*Agru Quote September 2023*
	Subtotal Geosynthetic Clay Liner				*$ 2,089,684*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Secondary Geomembrane	LS	1	$ 2,112,000	$ 2,112,000	
11.1	Secondary Geomembrane Material and Installation	SF	3,401,000	$ 0.62	$ 2,112,370	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 2,112,370*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Secondary Geocomposite	LS	1	$ 2,522,000	$ 2,522,000	
12.1	Secondary Geocomposite Material and Installation	SF	3,401,000	$ 0.74	$ 2,522,300	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 2,522,300*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Primary Geomembrane	LS	1	$ 2,112,000	$ 2,112,000	
13.1	Primary Geomembrane Material and Installation	SF	3,401,000	$ 0.62	$ 2,112,370	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 2,112,370*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Primary Geocomposite	LS	1	$ 2,522,000	$ 2,522,000	
14.1	Primary Geocomposite Material and Installation	SF	3,401,000	$ 0.74	$ 2,522,300	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 2,522,300*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 1,274,000	$ 1,274,000	
15.1	Trenches and Sump	LF	3,000	$ 425	$ 1,273,819	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 1,273,819*	

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PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
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BY: M.Morse DATE: 3/28/2024
CHECKED: R. Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Drainage Soil	LS	1	$ 10,046,000	$ 10,046,000	
16.1	Soil Material	CY	244,000	$ 37.31	$ 9,103,640	*FDOT Statewide 0120 2 2*
16.2	Grading	SY	293,000	$ 1.26	$ 369,180	*RSMeans Item 312216101020*
16.3	Spreading	CY	244,000	$ 2.35	$ 573,400	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 10,046,220*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Rain Tarp	LS	1	$ 1,461,000	$ 1,461,000	
17.1	Rain Tarp Material and Installation	SF	3,401,000	$ 0.43	$ 1,461,424	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 1,461,424*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
18	Pump Stations	LS	1	$ 2,588,000	$ 2,588,000	
18.1	Leachate Pump Station	EA	3	$ 862,500.00	$ 2,587,500	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 2,587,500*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
19	Leachate Force Main	LS	1	$ 140,000	$ 140,000	
19.1	6-inch SDR 11 Material and Installation	LF	5,700	$ 15.56	$ 88,692	*RSMeans 333111203020, x2 for installation*
19.2	Leachate Force Main Trench	CY	5200	$ 6.00	$ 31,200	*T&K 2023 Bid*
19.3	Miscellaneous fittings and valves	LS	1	$ 20,000.00	$ 20,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 139,892*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
20	Seeding and Sodding	LS	1	$ 377,000	$ 377,000	
20.1	Seeding (Assumed 10 Acres)	SY	48,400	$ 3.19	$ 154,396	*FDOT 0570 1 1*
20.2	Sodding (Assumed 10 Acres)	SY	48,400	$ 4.60	$ 222,640	*FDOT 0570 1 2*
	Subtotal Seeding and Sodding				*$ 377,036*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
21.1	Groundwater and Gas Well Installation and Abandonment	LS	1	$ 21,000.00	$ 21,000	*Preferred Drilling Quote May 2023*
	Subtotal Groundwater Monitoring Well Modifications				*$ 21,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
22	Paved and Unpaved Site Roads	LS	1	$ 901,000	$ 901,000	
22.1	Limerock Roads	SF	127,000	$ 7.09	$ 900,605	*T&K 2023 Bid*
	Subtotal Paved and Unpaved Site Roads				*$ 900,605*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
23	Karst Foundation Upgrades	LS	1	$ 13,133,000	$ 13,133,000	
23.1	Site-specific Hydrogeological Upgrades	AC	61	$ 217,000.00	$ 13,133,342	*Geohazards Estimate*
	Subtotal Karst Foundation Upgrades				*$ 13,133,342*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
24	Gas Collection and Control System	LS	1	$ 1,029,000	$ 1,029,000	
24.1	Gas Collection and Control System	AC	61	$ 17,000.00	$ 1,028,879	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 1,028,879*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
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BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 4

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 7,440,000	$ 7,440,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 1,600,000	$ 1,600,000	
3	Construction Surveying and Record Drawings	LS	1	$ 1,109,000	$ 1,109,000	
4	Clearing, Grubbing, and Stripping	LS	1	$ 1,052,000	$ 1,052,000	
5	Demolition	LS	1	$ 423,000	$ 423,000	
6	Stormwater System	LS	1	$ 420,000	$ 420,000	
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 39,906,000	$ 39,906,000	
8	Earthwork - Soil-to-Fill	LS	1	$ 957,000	$ 957,000	
9	Anchor Trench	LS	1	$ 233,000	$ 233,000	
10	Geosynthetic Clay Liner	LS	1	$ 4,805,000	$ 4,805,000	
11	Secondary Geomembrane	LS	1	$ 4,217,000	$ 4,217,000	
12	Secondary Geocomposite	LS	1	$ 5,036,000	$ 5,036,000	
13	Primary Geomembrane	LS	1	$ 4,217,000	$ 4,217,000	
14	Primary Geocomposite	LS	1	$ 5,036,000	$ 5,036,000	
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 4,119,000	$ 4,119,000	
16	Drainage Soil	LS	1	$ 23,099,000	$ 23,099,000	
17	Rain Tarp	LS	1	$ 2,918,000	$ 2,918,000	
18	Pump Stations	LS	1	$ 6,900,000	$ 6,900,000	
19	Leachate Force Main	LS	1	$ 246,000	$ 246,000	
20	Seeding and Sodding	LS	1	$ 754,000	$ 754,000	
21	Groundwater Monitoring Well Modifications	LS	1	$ 42,000	$ 42,000	
22	Paved and Unpaved Site Roads	LS	1	$ 1,702,000	$ 1,702,000	
23	Karst Foundation Upgrades	LS	1	$ 30,203,000	$ 30,203,000	
24	Gas Collection and Control System	LS	1	$ 2,366,000	$ 2,366,000	
Subtotal Base Bid					**$ 148,800,000**	
Contingency Allowance Base Bid (15%)					**$ 22,320,000**	
Total Bid					**$ 171,120,000**	

Development Assumptions

Landfill Area =	139.2	acres
No. of Collection Trenches =	4	
No. of Pumps Stations =	8	

Subtotal Contract Amount			**$ 148,800,000**
Landfill Unit Cost Without Contingency ($/acre)			**$ 1,069,088**
Contingency (15%)			**$ 22,320,000**
Total Contract Amount			**$ 171,120,000**
Landfill Unit Cost ($/acre)			**$ 1,229,451**
Total Cost Range	**$ 148,800,000**	**To**	**$ 171,100,000**
Cost Per Acre Range	**$ 1,070,000**	**To**	**$ 1,230,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 4
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 7,440,000	$ 7,440,000	*Max 5% of Contract*
	Total Contract Sum = $ 141,360,000					
1.1	Mobilization				$ 1,488,000	20%
1.2	Demobilization				$ 1,116,000	15%
1.3	Administration				$ 744,000	10%
1.4	Bonds				$ 744,000	10%
1.5	Insurance				$ 744,000	10%
1.6	Indemnification				$ 372,000	5%
1.7	Health and Safety				$ 372,000	5%
1.8	Field Offices/Temporary Utilities				$ 744,000	10%
1.9	Construction Permits				$ 372,000	5%
1.10	Submittals				$ 744,000	10%
	Subtotal Mobilization and Demobilization				*$ 7,440,000*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 1,600,000	$ 1,600,000	
2.1	Environmental Protection	LS	1	$ 1,600,000.00	$ 1,600,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 1,600,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 1,109,000	$ 1,109,000	
3.1	Construction Surveying and Record Drawings	AC	139	$ 7,968.20	$ 1,109,047	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 1,109,047*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Clearing, Grubbing, and Stripping	LS	1	$ 1,052,000	$ 1,052,000	
4.1	Clearing, Grubbing, and Stripping - Phase 4	AC	139	$ 7,555.04	$ 1,051,541	*Comanco 2024 Bid*
	Subtotal Clearing, Grubbing, and Stripping				*$ 1,051,541*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Demolition	LS	1	$ 423,000	$ 423,000	
5.1	Miscellaneous	AC	139	$ 3,039.72	$ 423,081	*Comanco 2024 Bid*
	Subtotal Demolition				*$ 423,081*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Stormwater System	LS	1	$ 420,000.00	$ 420,000	
6.1	36-inch RCP	LF	960	$ 177.15	$ 170,064	*RSMeans 334211602060*
6.2	36-inch MES	EA	24	$ 8,923.61	$ 214,167	*FDOT 0430982138*
6.3	Rip-rap	TON	187	$ 189.32	$ 35,340	*FDOT 0530 3 4*
	Subtotal Stormwater System				*$ 419,570*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 4
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 39,906,000	$ 39,906,000	
7.1	Subgrade Excavation to Stockpile and Backfill - Landfill Cell	CY	6,270,000	$ 6.00	$ 37,620,000	*T&K 2023 Bid*
7.2	Subgrade Excavation to Stockpile and Backfill - DRA	CY	381,000	$ 6.00	$ 2,286,000	*T&K 2023 Bid*
	Subtotal Earthwork - Subgrade Excavation Cut-to-Fill				*$ 39,906,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Earthwork - Soil-to-Fill	LS	1	$ 957,000	$ 957,000	
8.1	Grading	SY	674,000	$ 1.26	$ 849,240.00	*RSMeans Item 312216101020*
8.2	Spreading	CY	38,000	$ 2.35	$ 89,300.00	*RSMeans Item 312323170020*
8.3	Compaction	CY	38,000	$ 0.49	$ 18,620.00	*RSMeans Item 312323235100*
	Subtotal Earthwork - Soil-to-Fill				*$ 957,160*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Anchor Trench	LS	1	$ 233,000	$ 233,000	
9.1	Anchor Trench Construction	LF	9,500	$ 24.50	$ 232,771	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 232,771*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Geosynthetic Clay Liner	LS	1	$ 4,805,000	$ 4,805,000	
10.1	GCL Material and Installation	SF	6,790,000	$ 0.71	$ 4,804,929	*Agru Quote September 2023*
	Subtotal Geosynthetic Clay Liner				*$ 4,804,929*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Secondary Geomembrane	LS	1	$ 4,217,000	$ 4,217,000	
11.1	Secondary Geomembrane Material and Installation	SF	6,790,000	$ 0.62	$ 4,217,286	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 4,217,286*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Secondary Geocomposite	LS	1	$ 5,036,000	$ 5,036,000	
12.1	Secondary Geocomposite Material and Installation	SF	6,790,000	$ 0.74	$ 5,035,701	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 5,035,701*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Primary Geomembrane	LS	1	$ 4,217,000	$ 4,217,000	
13.1	Primary Geomembrane Material and Installation	SF	6,790,000	$ 0.62	$ 4,217,286	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 4,217,286*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Primary Geocomposite	LS	1	$ 5,036,000	$ 5,036,000	
14.1	Primary Geocomposite Material and Installation	SF	6,790,000	$ 0.74	$ 5,035,701	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 5,035,701*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 4,119,000	$ 4,119,000	
15.1	Trenches and Sump	LF	9,700	$ 425	$ 4,118,683	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 4,118,683*	

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PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 4
BY: M.Morse DATE: 3/28/2024
CHECKED: R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Drainage Soil	LS	1	$ 23,099,000	$ 23,099,000	
16.1	Soil Material	CY	561,000	$ 37.31	$ 20,930,910	*FDOT Statewide 0120 2 2*
16.2	Grading	SY	674,000	$ 1.26	$ 849,240	*RSMeans Item 312216101020*
16.3	Spreading	CY	561,000	$ 2.35	$ 1,318,350	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 23,098,500*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Rain Tarp	LS	1	$ 2,918,000	$ 2,918,000	
17.1	Rain Tarp Material and Installation	SF	6,790,000	$ 0.43	$ 2,917,691	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 2,917,691*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
18	Pump Stations	LS	1	$ 6,900,000	$ 6,900,000	
18.1	Leachate Pump Station	EA	8	$ 862,500.00	$ 6,900,000	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 6,900,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
19	Leachate Force Main	LS	1	$ 246,000	$ 246,000	
19.1	6-inch SDR 11 Material and Installation	LF	9,800	$ 15.56	$ 152,488	*RSMeans 333111203020, x2 for installation*
19.2	Leachate Force Main Trench	CY	9000	$ 6.00	$ 54,000	*T&K 2023 Bid*
19.3	Miscellaneous fittings and valves	LS	1	$ 40,000.00	$ 40,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 246,488*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
20	Seeding and Sodding	LS	1	$ 754,000	$ 754,000	
20.1	Seeding (Assumed 20 Acres)	SY	96,800	$ 3.19	$ 308,792	*FDOT 0570 1 1*
20.2	Sodding (Assumed 20 Acres)	SY	96,800	$ 4.60	$ 445,280	*FDOT 0570 1 2*
	Subtotal Seeding and Sodding				*$ 754,072*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
21	Groundwater Monitoring Well Modifications	LS	1	$ 42,000	$ 42,000	
21.1	Groundwater and Gas Well Installation and Abandonment	LS	1	$ 42,000.00	$ 42,000	*Preferred Drilling Quote May 2023*
	Subtotal Groundwater Monitoring Well Modifications				*$ 42,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
22	Paved and Unpaved Site Roads	LS	1	$ 1,702,000	$ 1,702,000	
22.1	Limerock Roads	SF	240,000	$ 7.09	$ 1,701,930	*T&K 2023 Bid*
	Subtotal Paved and Unpaved Site Roads				*$ 1,701,930*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
23	Karst Foundation Upgrades	LS	1	$ 30,203,000	$ 30,203,000	
23.1	Site-specific Hydrogeological Upgrades	AC	139	$ 217,000.00	$ 30,202,953	*Geohazards Estimate*
	Subtotal Karst Foundation Upgrades				*$ 30,202,953*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
24	Gas Collection and Control System	LS	1	$ 2,366,000	$ 2,366,000	
24.1	Gas Collection and Control System	AC	139	$ 17,000.00	$ 2,366,130	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 2,366,130*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 5
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 5

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 2,371,000	$ 2,371,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 459,000	$ 459,000	
3	Construction Surveying and Record Drawings	LS	1	$ 335,000	$ 335,000	
4	Clearing, Grubbing, and Stripping	LS	1	$ 317,000	$ 317,000	
5	Demolition	LS	1	$ 900,000	$ 900,000	
6	Stormwater System	LS	1	$ 140,000	$ 140,000	
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 12,474,000	$ 12,474,000	
8	Earthwork - Soil-to-Fill	LS	1	$ 318,000	$ 318,000	
9	Anchor Trench	LS	1	$ 108,000	$ 108,000	
10	Geosynthetic Clay Liner	LS	1	$ 1,450,000	$ 1,450,000	
11	Secondary Geomembrane	LS	1	$ 1,273,000	$ 1,273,000	
12	Secondary Geocomposite	LS	1	$ 1,520,000	$ 1,520,000	
13	Primary Geomembrane	LS	1	$ 1,273,000	$ 1,273,000	
14	Primary Geocomposite	LS	1	$ 1,520,000	$ 1,520,000	
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 934,000	$ 934,000	
16	Drainage Soil	LS	1	$ 6,958,000	$ 6,958,000	
17	Rain Tarp	LS	1	$ 880,000	$ 880,000	
18	Pump Stations	LS	1	$ 3,450,000	$ 3,450,000	
19	Leachate Force Main	LS	1	$ 107,000	$ 107,000	
20	Seeding and Sodding	LS	1	$ 302,000	$ 302,000	
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
22	Paved and Unpaved Site Roads	LS	1	$ 475,000	$ 475,000	
23	Karst Foundation Upgrades	LS	1	$ 9,112,000	$ 9,112,000	
24	Gas Collection and Control System	LS	1	$ 714,000	$ 714,000	
Subtotal Base Bid					**$ 47,411,000**	
Contingency Allowance Base Bid (15%)					**$ 7,112,000**	
Total Bid					**$ 54,523,000**	

Development Assumptions

Landfill Area =	42.0	acres
No. of Collection Trenches =	4	
No. of Pumps Stations =	4	

Subtotal Contract Amount			**$ 47,411,000**
Landfill Unit Cost Without Contingency ($/acre)			**$ 1,129,093**
Contingency (15%)			**$ 7,112,000**
Total Contract Amount			**$ 54,523,000**
Landfill Unit Cost ($/acre)			**$ 1,298,465**
Total Cost Range	**$ 47,400,000**	**To**	**$ 54,500,000**
Cost Per Acre Range	**$ 1,130,000**	**To**	**$ 1,300,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 5
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 2,371,000	$ 2,371,000	*Max 5% of Contract*
	Total Contract Sum = $ 45,040,000					
1.1	Mobilization				$ 474,105	20%
1.2	Demobilization				$ 355,579	15%
1.3	Administration				$ 237,053	10%
1.4	Bonds				$ 237,053	10%
1.5	Insurance				$ 237,053	10%
1.6	Indemnification				$ 118,526	5%
1.7	Health and Safety				$ 118,526	5%
1.8	Field Offices/Temporary Utilities				$ 237,053	10%
1.9	Construction Permits				$ 118,526	5%
1.10	Submittals				$ 237,053	10%
	Subtotal Mobilization and Demobilization				*$ 2,370,526*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 459,000	$ 459,000	
2.1	Environmental Protection	LS	1	$ 459,000.00	$ 459,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 459,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 335,000	$ 335,000	
3.1	Construction Surveying and Record Drawings	AC	42	$ 7,968.20	$ 334,587	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 334,587*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Clearing, Grubbing, and Stripping	LS	1	$ 317,000	$ 317,000	
4.1	Clearing, Grubbing, and Stripping	AC	42	$ 7,555.04	$ 317,238	*Comanco 2024 Bid*
	Subtotal Clearing, Grubbing, and Stripping				*$ 317,238*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Demolition	LS	1	$ 900,000	$ 900,000	
5.1	Miscellaneous	LS	1.0	$ 900,000.00	$ 900,000	*RSMeans*
	Subtotal Demolition				*$ 900,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Stormwater System	LS	1	$ 140,000.00	$ 140,000	
6.1	36-inch RCP	LF	320	$ 177.15	$ 56,688	*RSMeans 334211602060*
6.2	36-inch MES	EA	8	$ 8,923.61	$ 71,389	*FDOT 0430982138*
6.3	Rip-rap	TON	62	$ 189.32	$ 11,780	*FDOT 0530 3 4*
	Subtotal Stormwater System				*$ 139,857*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 5
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 12,474,000	$ 12,474,000	
7.1	Subgrade Excavation to Stockpile and Backfill	CY	1,722,000	$ 6.00	$ 10,332,000	*T&K 2023 Bid*
7.2	Subgrade Excavation to Stockpile and Backfill - DRA	CY	357,000	$ 6.00	$ 2,142,000	*T&K 2023 Bid*
	Subtotal Earthwork - Subgrade Excavation Cut-to-Fill				*$ 12,474,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Earthwork - Soil-to-Fill	LS	1	$ 318,000	$ 318,000	
8.1	Grading	SY	203,000	$ 1.26	$ 255,780.00	*RSMeans Item 312216101020*
8.2	Spreading	CY	22,000	$ 2.35	$ 51,700.00	*RSMeans Item 312323170020*
8.3	Compaction	CY	22,000	$ 0.49	$ 10,780.00	*RSMeans Item 312323235100*
	Subtotal Earthwork - Soil-to-Fill				*$ 318,260*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Anchor Trench	LS	1	$ 108,000	$ 108,000	
9.1	Anchor Trench Construction	LF	4,400	$ 24.50	$ 107,810	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 107,810*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Geosynthetic Clay Liner	LS	1	$ 1,450,000	$ 1,450,000	
10.1	GCL Material and Installation	SF	2,049,000	$ 0.71	$ 1,449,970	*Agru Quote September 2023*
	Subtotal Geosynthetic Clay Liner				*$ 1,449,970*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Secondary Geomembrane	LS	1	$ 1,273,000	$ 1,273,000	
11.1	Secondary Geomembrane Material and Installation	SF	2,049,000	$ 0.62	$ 1,272,639	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 1,272,639*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Secondary Geocomposite	LS	1	$ 1,520,000	$ 1,520,000	
12.1	Secondary Geocomposite Material and Installation	SF	2,049,000	$ 0.74	$ 1,519,610	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 1,519,610*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Primary Geomembrane	LS	1	$ 1,273,000	$ 1,273,000	
13.1	Primary Geomembrane Material and Installation	SF	2,049,000	$ 0.62	$ 1,272,639	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 1,272,639*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Primary Geocomposite	LS	1	$ 1,520,000	$ 1,520,000	
14.1	Primary Geocomposite Material and Installation	SF	2,049,000	$ 0.74	$ 1,519,610	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 1,519,610*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 934,000	$ 934,000	
15.1	Trenches and Sump	LF	2,200	$ 425	$ 934,134	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 934,134*	

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PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 5
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Drainage Soil	LS	1	$ 6,958,000	$ 6,958,000	
16.1	Soil Material	CY	169,000	$ 37.31	$ 6,305,390	*FDOT Statewide 0120 2 2*
16.2	Grading	SY	203,000	$ 1.26	$ 255,780	*RSMeans Item 312216101020*
16.3	Spreading	CY	169,000	$ 2.35	$ 397,150	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 6,958,320*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Rain Tarp	LS	1	$ 880,000	$ 880,000	
17.1	Rain Tarp Material and Installation	SF	2,049,000	$ 0.43	$ 880,464	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 880,464*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
18	Pump Stations	LS	1	$ 3,450,000	$ 3,450,000	
18.1	Leachate Pump Station	EA	4	$ 862,500.00	$ 3,450,000	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 3,450,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
19	Leachate Force Main	LS	1	$ 107,000	$ 107,000	
19.1	6-inch SDR 11 Material and Installation	LF	4,100	$ 15.56	$ 63,796	*RSMeans 333111203020, x2 for installation*
19.2	Leachate Force Main Trench	CY	3800	$ 6.00	$ 22,800	*T&K 2023 Bid*
19.3	Miscellaneous fittings and valves	LS	1	$ 20,000.00	$ 20,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 106,596*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
20	Seeding and Sodding	LS	1	$ 302,000	$ 302,000	
20.1	Seeding (Assumed 8 Acres)	SY	38,720	$ 3.19	$ 123,517	*FDOT 0570 1 1*
20.2	Sodding (Assumed 8 Acres)	SY	38,720	$ 4.60	$ 178,112	*FDOT 0570 1 2*
	Subtotal Seeding and Sodding				*$ 301,629*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
21.1	Groundwater and Gas Well Installation and Abandonment	LS	1	$ 21,000.00	$ 21,000	*Preferred Drilling Quote May 2023*
	Subtotal Groundwater Monitoring Well Modifications				*$ 21,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
22	Paved and Unpaved Site Roads	LS	1	$ 475,000	$ 475,000	
22.1	Limerock Roads	SF	67,000	$ 7.09	$ 475,122	*T&K 2023 Bid*
	Subtotal Paved and Unpaved Site Roads				*$ 475,122*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
23	Karst Foundation Upgrades	LS	1	$ 9,112,000	$ 9,112,000	
23.1	Site-specific Hydrogeological Upgrades	AC	42	$ 217,000.00	$ 9,111,903	*Geohazards Estimate*
	Subtotal Karst Foundation Upgrades				*$ 9,111,903*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
24	Gas Collection and Control System	LS	1	$ 714,000	$ 714,000	
24.1	Gas Collection and Control System	AC	42	$ 17,000.00	$ 713,836	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 713,836*	

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 6
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Marion County Baseline Landfill
Site Master Planning
Engineer's Opinion of Probable Construction Cost - Phase 5

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
BASE BID						
1	Mobilization and Demobilization	LS	1	$ 799,000	$ 799,000	*Maximum 5% of contract.*
2	Environmental Protection	LS	1	$ 173,000	$ 173,000	
3	Construction Surveying and Record Drawings	LS	1	$ 120,000	$ 120,000	
4	Clearing, Grubbing, and Stripping	LS	1	$ 114,000	$ 114,000	
5	Demolition	LS	1	$ 131,000	$ 131,000	
6	Stormwater System	LS	1	$ 35,000	$ 35,000	
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 1,974,000	$ 1,974,000	
8	Earthwork - Soil-to-Fill	LS	1	$ 100,000	$ 100,000	
9	Anchor Trench	LS	1	$ 10,000	$ 10,000	
10	Geosynthetic Clay Liner	LS	1	$ 521,000	$ 521,000	
11	Secondary Geomembrane	LS	1	$ 457,000	$ 457,000	
12	Secondary Geocomposite	LS	1	$ 546,000	$ 546,000	
13	Primary Geomembrane	LS	1	$ 457,000	$ 457,000	
14	Primary Geocomposite	LS	1	$ 546,000	$ 546,000	
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 1,529,000	$ 1,529,000	
16	Drainage Soil	LS	1	$ 2,511,000	$ 2,511,000	
17	Rain Tarp	LS	1	$ 316,000	$ 316,000	
18	Pump Stations	LS	1	$ 1,725,000	$ 1,725,000	
19	Leachate Force Main	LS	1	$ 163,000	$ 163,000	
20	Seeding and Sodding	LS	1	$ 151,000	$ 151,000	
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
22	Paved and Unpaved Site Roads	LS	1	$ 51,000	$ 51,000	
23	Karst Foundation Upgrades	LS	1	$ 3,272,000	$ 3,272,000	
24	Gas Collection and Control System	LS	1	$ 256,000	$ 256,000	
Subtotal Base Bid					**$ 15,978,000**	
Contingency Allowance Base Bid (15%)					**$ 2,397,000**	
Total Bid					**$ 18,375,000**	

Development Assumptions

Landfill Area =	15.1	acres
No. of Collection Trenches =	2	
No. of Pumps Stations =	2	

Subtotal Contract Amount			**$ 15,978,000**
Landfill Unit Cost Without Contingency ($/acre)			**$ 1,059,546**
Contingency (15%)			**$ 2,397,000**
Total Contract Amount			**$ 18,375,000**
Landfill Unit Cost ($/acre)			**$ 1,218,498**
Total Cost Range	**$ 16,000,000**	**To**	**$ 18,400,000**
Cost Per Acre Range	**$ 1,060,000**	**To**	**$ 1,220,000**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 6
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
1	Mobilization and Demobilization	LS	1	$ 799,000	$ 799,000	*Max 5% of Contract*
	Total Contract Sum = $ 15,179,000					
1.1	Mobilization				$ 159,779	20%
1.2	Demobilization				$ 119,834	15%
1.3	Administration				$ 79,889	10%
1.4	Bonds				$ 79,889	10%
1.5	Insurance				$ 79,889	10%
1.6	Indemnification				$ 39,945	5%
1.7	Health and Safety				$ 39,945	5%
1.8	Field Offices/Temporary Utilities				$ 79,889	10%
1.9	Construction Permits				$ 39,945	5%
1.10	Submittals				$ 79,889	10%
	Subtotal Mobilization and Demobilization				*$ 798,895*	*100%*

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
2	Environmental Protection	LS	1	$ 173,000	$ 173,000	
2.1	Environmental Protection	LS	1	$ 173,000.00	$ 173,000	*Citrus Phase 4A bids, 2023*
	Subtotal Environmental Protection				*$ 173,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
3	Construction Surveying and Record Drawings	LS	1	$ 120,000	$ 120,000	
3.1	Construction Surveying and Record Drawings	AC	15	$ 7,968.20	$ 120,161	*Comanco 2024 Bid*
	Subtotal Construction Surveying and Record Drawings				*$ 120,161*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
4	Clearing, Grubbing, and Stripping	LS	1	$ 114,000	$ 114,000	
4.1	Clearing, Grubbing, and Stripping	AC	15.1	$ 7,555.04	$ 113,930	*Comanco 2024 Bid*
	Subtotal Clearing, Grubbing, and Stripping				*$ 113,930*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
5	Demolition	LS	1	$ 131,000	$ 131,000	
5.1	Road Demolition	SY	12,000	$ 7.09	$ 85,080	*RSMeans 024113175010 with +$1 for disposal*
5.2	Miscellaneous	AC	15.1	$ 3,039.72	$ 45,839	*Comanco 2024 Bid*
	Subtotal Demolition				*$ 130,919*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
6	Stormwater System	LS	1	$ 35,000.00	$ 35,000	
6.1	36-inch RCP	LF	80	$ 177.15	$ 14,172	*RSMeans 334211602060*
6.2	36-inch MES	EA	2	$ 8,923.61	$ 17,847	*FDOT 0430982138*
6.3	Rip-rap	TON	16	$ 189.32	$ 2,945	*FDOT 0530 3 4*
	Subtotal Stormwater System				*$ 34,964*	

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Budgetary Construction Cost Estimate - Phase 6
BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
7	Earthwork - Subgrade Excavation Cut-to-Fill	LS	1	$ 1,974,000	$ 1,974,000	
7.1	Subgrade Excavation to Stockpile and Backfill	CY	329,000	$ 6.00	$ 1,974,000	*T&K 2023 Bid*
	Subtotal Earthwork - Subgrade Excavation Cut-to-Fill				*$ 1,974,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
8	Earthwork - Soil-to-Fill	LS	1	$ 100,000	$ 100,000	
8.1	Grading	SY	73,000	$ 1.26	$ 91,980.00	*RSMeans Item 312216101020*
8.2	Spreading	CY	2,700	$ 2.35	$ 6,345.00	*RSMeans Item 312323170020*
8.3	Compaction	CY	2,700	$ 0.49	$ 1,323.00	*RSMeans Item 312323235100*
	Subtotal Earthwork - Soil-to-Fill				*$ 99,648*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
9	Anchor Trench	LS	1	$ 10,000	$ 10,000	
9.1	Anchor Trench Construction	LF	420	$ 24.50	$ 10,279	*Comanco 2024 Bid*
	Subtotal Anchor Trench				*$ 10,279*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
10	Geosynthetic Clay Liner	LS	1	$ 521,000	$ 521,000	
10.1	GCL Material and Installation	SF	736,000	$ 0.71	$ 520,829	*Agru Quote September 2023*
	Subtotal Geosynthetic Clay Liner				*$ 520,829*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
11	Secondary Geomembrane	LS	1	$ 457,000	$ 457,000	
11.1	Secondary Geomembrane Material and Installation	SF	736,000	$ 0.62	$ 457,131	*Agru Quote September 2023*
	Subtotal Secondary Geomembrane				*$ 457,131*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
12	Secondary Geocomposite	LS	1	$ 546,000	$ 546,000	
12.1	Secondary Geocomposite Material and Installation	SF	736,000	$ 0.74	$ 545,843	*Agru Quote September 2023*
	Subtotal Secondary Geocomposite				*$ 545,843*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
13	Primary Geomembrane	LS	1	$ 457,000	$ 457,000	
13.1	Primary Geomembrane Material and Installation	SF	736,000	$ 0.62	$ 457,131	*Agru Quote September 2023*
	Subtotal Primary Geomembrane				*$ 457,131*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
14	Primary Geocomposite	LS	1	$ 546,000	$ 546,000	
14.1	Primary Geocomposite Material and Installation	SF	736,000	$ 0.74	$ 545,843	*Agru Quote September 2023*
	Subtotal Primary Geocomposite				*$ 545,843*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
15	Leak Detection and Leachate Collection Trenches and Sumps	LS	1	$ 1,529,000	$ 1,529,000	
15.1	Trenches and Sump	LF	3,600	$ 425	$ 1,528,583	*Comanco 2024 Bid*
	Subtotal Leak Detection and Leachate Collection Trenches and Sumps				*$ 1,528,583*	

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PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
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BY: M.Morse DATE: 3/28/2024
CHECKED: M.Deaderick DATE: 4/15/2024
R.Bichier DATE: 4/22/2024
M.Morse DATE 5/24/2025

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
16	Drainage Soil	LS	1	$ 2,511,000	$ 2,511,000	
16.1	Soil Material	CY	61,000	$ 37.31	$ 2,275,910	*FDOT Statewide 0120 2 2*
16.2	Grading	SY	73,000	$ 1.26	$ 91,980	*RSMeans Item 312216101020*
16.3	Spreading	CY	61,000	$ 2.35	$ 143,350	*RSMeans Item 312323170020*
	Subtotal Drainage Soil				*$ 2,511,240*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
17	Rain Tarp	LS	1	$ 316,000	$ 316,000	
17.1	Rain Tarp Material and Installation	SF	736,000	$ 0.43	$ 316,262	*Agru Quote September 2023*
	Subtotal Rain Tarp				*$ 316,262*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
18	Pump Stations	LS	1	$ 1,725,000	$ 1,725,000	
18.1	Leachate Pump Station	EA	2	$ 862,500.00	$ 1,725,000	*Comanco 2024 Bid*
	Subtotal Pump Stations				*$ 1,725,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
19	Leachate Force Main	LS	1	$ 163,000	$ 163,000	
19.1	6-inch SDR 11 Material and Installation	LF	6,800	$ 15.56	$ 105,808	*RSMeans 333111203020, x2 for installation*
19.2	Leachate Force Main Trench	CY	6200	$ 6.00	$ 37,200	*T&K 2023 Bid*
19.3	Miscellaneous fittings and valves	LS	1	$ 20,000.00	$ 20,000	*Engineer's Opinion*
	Subtotal Leachate Force Main				*$ 163,008*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
20	Seeding and Sodding	LS	1	$ 151,000	$ 151,000	
20.1	Seeding (Assumed 4 Acres)	SY	19,360	$ 3.19	$ 61,758	*FDOT 0570 1 1*
20.2	Sodding (Assumed 4 Acres)	SY	19,360	$ 4.60	$ 89,056	*FDOT 0570 1 2*
	Subtotal Seeding and Sodding				*$ 150,814*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
21	Groundwater Monitoring Well Modifications	LS	1	$ 21,000	$ 21,000	
21.1	Groundwater and Gas Well Installation and Abandonment	LS	1	$ 21,000.00	$ 21,000	*Preferred Drilling Quote May 2023*
	Subtotal Groundwater Monitoring Well Modifications				*$ 21,000*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
22	Paved and Unpaved Site Roads	LS	1	$ 51,000	$ 51,000	
22.1	Limerock Roads	SF	7,200	$ 7.09	$ 51,058	*T&K 2023 Bid*
	Subtotal Paved and Unpaved Site Roads				*$ 51,058*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
23	Karst Foundation Upgrades	LS	1	$ 3,272,000	$ 3,272,000	
23.1	Site-specific Hydrogeological Upgrades	AC	15	$ 217,000.00	$ 3,272,368	*Geohazards Estimate*
	Subtotal Karst Foundation Upgrades				*$ 3,272,368*	

Item No.	Description	Unit	Quantity	Unit Price	Total Price	Comment
24	Gas Collection and Control System	LS	1	$ 256,000	$ 256,000	
24.1	Gas Collection and Control System	AC	15	$ 17,000.00	$ 256,361	*T&K 2023 Bid*
	Subtotal Gas Collection and Control System				*$ 256,361*	

Appendix B

Capacity and Lifespan Calculations

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PROJECT NUMBER: 13150-293-01 SHEET 1 of 4
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Objective: To determine the remaining life from present day of the active Baseline Class I Landfill.

1. Calculate the annual population growth rate projections
2. Calculate the anticipated lifespan.

Data:

Starting Annual Waste Disposal Rate =			190,971 Tons	*(Reference 1)*
Phase 1 Disposal Volume Remaining (as of 3/29/2023) =	1,872,881 CY =		1,404,661 tons	*(Reference 2)*
Phase 2 Disposal Volume =	1,689,475 CY =		1,267,106 tons	*(Reference 2)*
Phase 3 Disposal Volume =	15,544,766 CY =		11,658,574 tons	*(Reference 2)*
Phase 4 Disposal Volume =	33,106,474 CY =		24,829,856 tons	*(Reference 2)*
Phase 5 Disposal Volume =	8,105,083 CY =		6,078,812 tons	*(Reference 2)*
Phase 6 Disposal Volume =	17,820,792 CY =		13,365,594 tons	*(Reference 2)*
Lifespan Calculation Start Date =	1/1/2028			

Assumptions:

1. Waste generation growth rates are directly proportional to population growth rates (Attachment 1).
2. Waste apparent density is 1,500 lb/CY, based on historical site-specific data.
3. Waste acceptance in Phase 1 begins January 1, 2028.

Waste density:

$$\rho_i = \frac{Class\ I\ Materials\ Received\ (tons)}{Volume\ Consumed\ (CY)} * (2000 \frac{\text{lbs}}{\text{ton}})$$

1500 lb/CY
0.75 tons/CY
(Reference 3)

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2023		190,971	618	0.75	254,628						
2024	0.94%	192,766	624	0.75	257,022						
2025	0.94%	194,578	630	0.75	259,438						
2026	0.94%	196,407	636	0.75	261,876						
2027	0.94%	198,253	642	0.75	264,338	1,872,881					
2028	0.94%	200,117	648	0.75	266,823	1,606,058					
2029	0.94%	201,998	654	0.75	269,331	1,336,727					
2030	0.94%	203,897	660	0.75	271,863	1,064,865					
2031	0.94%	205,814	666	0.75	274,418	790,447					
2032	0.94%	207,748	672	0.75	276,998	513,449					
2033	0.94%	209,701	679	0.75	279,601	233,848	1,689,475				
2034	0.94%	211,672	685	0.75	282,230	(48,382)	1,641,093				
2035	0.94%	213,662	691	0.75	284,883		1,356,211				
2036	0.94%	215,670	698	0.75	287,560		1,068,650				
2037	0.94%	217,698	705	0.75	290,264		778,387				
2038	0.94%	219,744	711	0.75	292,992		485,395				
2039	0.94%	221,810	718	0.75	295,746		189,649	15,544,766			
2040	0.94%	223,895	725	0.75	298,526		(108,878)	15,435,888			
2041	0.94%	225,999	731	0.75	301,332			15,134,556			
2042	0.94%	228,124	738	0.75	304,165			14,830,391			
2043	0.94%	230,268	745	0.75	307,024			14,523,367			
2044	0.94%	232,432	752	0.75	309,910			14,213,457			

Phase 1 Remaining Life from January 2028 = 6.8 years
Phase 1 Anticipated Closure Date = **October 2034**
Phase 2 Remaining Life from October 2034 = 5.8 years
Phase 2 Anticipated Closure Date = **August 2040**

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PROJECT NUMBER: 13150-293-01 SHEET 2 of 4
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2045	0.94%	234,617	759	0.75	312,823			13,900,634			
2046	0.94%	236,823	766	0.75	315,764			13,584,870			
2047	0.94%	239,049	774	0.75	318,732			13,266,138			
2048	0.94%	241,296	781	0.75	321,728			12,944,410			
2049	0.94%	243,564	788	0.75	324,752			12,619,658			
2050	0.94%	245,854	796	0.75	327,805			12,291,853			
2051	0.94%	248,165	803	0.75	330,886			11,960,967			
2052	0.94%	250,497	811	0.75	333,997			11,626,970			
2053	0.94%	252,852	818	0.75	337,136			11,289,834			
2054	0.94%	255,229	826	0.75	340,305			10,949,529			
2055	0.94%	257,628	834	0.75	343,504			10,606,025			
2056	0.94%	260,050	842	0.75	346,733			10,259,292			
2057	0.94%	262,494	849	0.75	349,992			9,909,300			
2058	0.94%	264,962	857	0.75	353,282			9,556,018			
2059	0.94%	267,452	866	0.75	356,603			9,199,414			
2060	0.94%	269,966	874	0.75	359,955			8,839,459			
2061	0.94%	272,504	882	0.75	363,339			8,476,121			
2062	0.94%	275,066	890	0.75	366,754			8,109,366			
2063	0.94%	277,651	899	0.75	370,202			7,739,165			
2064	0.94%	280,261	907	0.75	373,681			7,365,483			
2065	0.94%	282,896	916	0.75	377,194			6,988,289			
2066	0.94%	285,555	924	0.75	380,740			6,607,550			
2067	0.94%	288,239	933	0.75	384,319			6,223,231			
2068	0.94%	290,948	942	0.75	387,931			5,835,300			
2069	0.94%	293,683	950	0.75	391,578			5,443,722			
2070	0.94%	296,444	959	0.75	395,259			5,048,463			
2071	0.94%	299,231	968	0.75	398,974			4,649,489			
2072	0.94%	302,043	977	0.75	402,724			4,246,765			
2073	0.94%	304,883	987	0.75	406,510			3,840,255			
2074	0.94%	307,748	996	0.75	410,331			3,429,923			
2075	0.94%	310,641	1005	0.75	414,188			3,015,735			
2076	0.94%	313,561	1015	0.75	418,082			2,597,653			
2077	0.94%	316,509	1024	0.75	422,012			2,175,641			
2078	0.94%	319,484	1034	0.75	425,979			1,749,663			
2079	0.94%	322,487	1044	0.75	429,983			1,319,680			
2080	0.94%	325,518	1053	0.75	434,025			885,655			
2081	0.94%	328,578	1063	0.75	438,104			447,551			
2082	0.94%	331,667	1073	0.75	442,223			5,328	33,106,474		
2083	0.94%	334,785	1083	0.75	446,380			(441,051)	32,665,423		
2084	0.94%	337,932	1094	0.75	450,576				32,214,848		
2085	0.94%	341,108	1104	0.75	454,811				31,760,037		
2086	0.94%	344,315	1114	0.75	459,086				31,300,950		
2087	0.94%	347,551	1125	0.75	463,402				30,837,549		
2088	0.94%	350,818	1135	0.75	467,758				30,369,791		

Phase 3 Remaining Life from August 2040 = 42.4 years
Phase 3 Anticipated Closure Date = **December 2082**

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PROJECT NUMBER: 13150-293-01 SHEET 3 of 4
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2089	0.94%	354,116	1146	0.75	472,154				29,897,637		
2090	0.94%	357,445	1157	0.75	476,593				29,421,044		
2091	0.94%	360,805	1168	0.75	481,073				28,939,971		
2092	0.94%	364,196	1179	0.75	485,595				28,454,377		
2093	0.94%	367,620	1190	0.75	490,159				27,964,217		
2094	0.94%	371,075	1201	0.75	494,767				27,469,450		
2095	0.94%	374,563	1212	0.75	499,418				26,970,033		
2096	0.94%	378,084	1224	0.75	504,112				26,465,921		
2097	0.94%	381,638	1235	0.75	508,851				25,957,070		
2098	0.94%	385,226	1247	0.75	513,634				25,443,436		
2099	0.94%	388,847	1258	0.75	518,462				24,924,974		
2100	0.94%	392,502	1270	0.75	523,336				24,401,638		
2101	0.94%	396,191	1282	0.75	528,255				23,873,383		
2102	0.94%	399,916	1294	0.75	533,221				23,340,162		
2103	0.94%	403,675	1306	0.75	538,233				22,801,929		
2104	0.94%	407,469	1319	0.75	543,292				22,258,637		
2105	0.94%	411,299	1331	0.75	548,399				21,710,237		
2106	0.94%	415,166	1344	0.75	553,554				21,156,683		
2107	0.94%	419,068	1356	0.75	558,758				20,597,925		
2108	0.94%	423,008	1369	0.75	564,010				20,033,915		
2109	0.94%	426,984	1382	0.75	569,312				19,464,604		
2110	0.94%	430,997	1395	0.75	574,663				18,889,940		
2111	0.94%	435,049	1408	0.75	580,065				18,309,875		
2112	0.94%	439,138	1421	0.75	585,518				17,724,358		
2113	0.94%	443,266	1435	0.75	591,022				17,133,336		
2114	0.94%	447,433	1448	0.75	596,577				16,536,759		
2115	0.94%	451,639	1462	0.75	602,185				15,934,574		
2116	0.94%	455,884	1475	0.75	607,846				15,326,729		
2117	0.94%	460,169	1489	0.75	613,559				14,713,169		
2118	0.94%	464,495	1503	0.75	619,327				14,093,843		
2119	0.94%	468,861	1517	0.75	625,148				13,468,694		
2120	0.94%	473,269	1532	0.75	631,025				12,837,669		
2121	0.94%	477,717	1546	0.75	636,956				12,200,713		
2122	0.94%	482,208	1561	0.75	642,944				11,557,769		
2123	0.94%	486,741	1575	0.75	648,987				10,908,782		
2124	0.94%	491,316	1590	0.75	655,088				10,253,694		
2125	0.94%	495,934	1605	0.75	661,246				9,592,448		
2126	0.94%	500,596	1620	0.75	667,461				8,924,987		
2127	0.94%	505,302	1635	0.75	673,736				8,251,251		
2128	0.94%	510,052	1651	0.75	680,069				7,571,182		
2129	0.94%	514,846	1666	0.75	686,461				6,884,721		
2130	0.94%	519,686	1682	0.75	692,914				6,191,807		
2131	0.94%	524,571	1698	0.75	699,428				5,492,379		
2132	0.94%	529,502	1714	0.75	706,002				4,786,377		
2133	0.94%	534,479	1730	0.75	712,639				4,073,738		
2134	0.94%	539,503	1746	0.75	719,337				3,354,401		
2135	0.94%	544,574	1762	0.75	726,099				2,628,302		
2136	0.94%	549,693	1779	0.75	732,924				1,895,377		
2137	0.94%	554,860	1796	0.75	739,814				1,155,564		
2138	0.94%	560,076	1813	0.75	746,768				408,795	8,105,083	
2139	0.94%	565,341	1830	0.75	753,788				(344,993)	7,760,090	
2140	0.94%	570,655	1847	0.75	760,873					6,999,217	
2141	0.94%	576,019	1864	0.75	768,026					6,231,191	

Phase 4 Remaining Life from December 2082 = 56.5 years
Phase 4 Anticipated Closure Date = **June 2139**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 4 of 4
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2142	0.94%	581,434	1882	0.75	775,245					5,455,946	
2143	0.94%	586,899	1899	0.75	782,532					4,673,414	
2144	0.94%	592,416	1917	0.75	789,888					3,883,526	
2145	0.94%	597,985	1935	0.75	797,313					3,086,213	
2146	0.94%	603,606	1953	0.75	804,808					2,281,405	
2147	0.94%	609,280	1972	0.75	812,373					1,469,032	
2148	0.94%	615,007	1990	0.75	820,009					649,022	17,820,792
2149	0.94%	620,788	2009	0.75	827,717					(178,695)	17,642,096
2150	0.94%	626,624	2028	0.75	835,498						16,806,598
2151	0.94%	632,514	2047	0.75	843,352						15,963,247
2152	0.94%	638,459	2066	0.75	851,279						15,111,967
2153	0.94%	644,461	2086	0.75	859,281						14,252,686
2154	0.94%	650,519	2105	0.75	867,358						13,385,328
2155	0.94%	656,634	2125	0.75	875,512						12,509,816
2156	0.94%	662,806	2145	0.75	883,741						11,626,075
2157	0.94%	669,036	2165	0.75	892,049						10,734,026
2158	0.94%	675,325	2186	0.75	900,434						9,833,592
2159	0.94%	681,673	2206	0.75	908,898						8,924,694
2160	0.94%	688,081	2227	0.75	917,442						8,007,253
2161	0.94%	694,549	2248	0.75	926,066						7,081,187
2162	0.94%	701,078	2269	0.75	934,771						6,146,416
2163	0.94%	707,668	2290	0.75	943,557						5,202,859
2164	0.94%	714,320	2312	0.75	952,427						4,250,432
2165	0.94%	721,035	2333	0.75	961,380						3,289,053
2166	0.94%	727,812	2355	0.75	970,417						2,318,636
2167	0.94%	734,654	2378	0.75	979,539						1,339,097
2168	0.94%	741,560	2400	0.75	988,746						350,351
2169	0.94%	748,530	2422	0.75	998,040						(647,689)

Phase 5 Remaining Life from June 2139 = 10.2 years
Phase 5 Anticipated Closure Date = **September 2149**
Phase 6 Remaining Life from September 2149 = 19.6 years
Phase 6 Anticipated Closure Date = **April 2169**

Notes:

(1) Waste growth rate based on BEBR Population Growth Rate (Reference 4).
(2) Tonnages per year taken from Marion County annual material reports (Reference 1).
(3) Average tons per day estimated based on 309 working days in one year.
(4) Remaining volume at the end of the calendar year.

References:

1. Marion County Tonnage Data.
2. CADD File Volume Analysis, Jones Edmunds, February 2024.
3. Historical Lifespan and Capacity Analysis Calculations
4. Projections of Florida Population by County, 2025–2050, with Estimates for 2023, Volume 57, Bulletin 198 of Florida Population Studies, January 2024.

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 1 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Objective: To determine the remaining life from present day of the active Baseline Class I Landfill.

1. Calculate the annual population growth rate projections
2. Calculate the anticipated lifespan.

Data:

Starting Annual Waste Disposal Rate =			190,971 Tons	*(Reference 1)*
Phase 1 Disposal Volume Remaining (as of 3/29/2023) =	1,872,881 CY =		1,404,661 tons	*(Reference 2)*
Phase 2 Disposal Volume =	1,689,475 CY =		1,267,106 tons	*(Reference 2)*
Phase 3 Disposal Volume =	15,544,766 CY =		11,658,574 tons	*(Reference 2)*
Phase 4 Disposal Volume =	33,106,474 CY =		24,829,856 tons	*(Reference 2)*
Phase 5 Disposal Volume =	8,105,083 CY =		6,078,812 tons	*(Reference 2)*
Phase 6 Disposal Volume =	17,820,792 CY =		13,365,594 tons	*(Reference 2)*
Lifespan Calculation Start Date =	1/1/2028			

Assumptions:

1. Waste generation growth rates are directly proportional to population growth rates (Attachment 1).
2. Waste apparent density is 1,500 lb/CY, based on historical site-specific data.
3. Waste acceptance in Phase 1 begins January 1, 2028.

Waste density:

$$\rho_i = \frac{Class\ I\ Materials\ Received\ (tons)}{Volume\ Consumed\ (CY)} * (2000 \frac{\text{lbs}}{\text{ton}})$$

1500 lb/CY
0.75 tons/CY
(Reference 3)

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2023		190,971	618	0.75	254,628						
2024	1.56%	193,950	628	0.75	258,600						
2025	1.56%	196,976	637	0.75	262,634						
2026	1.56%	200,049	647	0.75	266,732						
2027	1.56%	203,169	658	0.75	270,893	1,872,881					
2028	1.56%	206,339	668	0.75	275,118	1,597,763					
2029	1.56%	209,558	678	0.75	279,410	1,318,352					
2030	1.56%	212,827	689	0.75	283,769	1,034,583					
2031	1.56%	216,147	700	0.75	288,196	746,387					
2032	1.56%	219,519	710	0.75	292,692	453,695					
2033	1.56%	222,943	721	0.75	297,258	156,438	1,689,475				
2034	1.56%	226,421	733	0.75	301,895	(145,457)	1,544,018				
2035	1.56%	229,953	744	0.75	306,605		1,237,413				
2036	1.56%	233,541	756	0.75	311,388		926,026				
2037	1.56%	237,184	768	0.75	316,245		609,780				
2038	1.56%	240,884	780	0.75	321,179		288,602	15,544,766			
2039	1.56%	244,642	792	0.75	326,189		(37,587)	15,507,178			
2040	1.56%	248,458	804	0.75	331,278			15,175,901			
2041	1.56%	252,334	817	0.75	336,446			14,839,455			
2042	1.56%	256,271	829	0.75	341,694			14,497,761			
2043	1.56%	260,268	842	0.75	347,024			14,150,737			
2044	1.56%	264,329	855	0.75	352,438			13,798,299			

Phase 1 Remaining Life from January 2028 = 6.5 years
Phase 1 Anticipated Closure Date = **July 2034**
Phase 2 Remaining Life from July 2034 = 5.4 years
Phase 2 Anticipated Closure Date = **November 2039**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 2 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2045	1.56%	268,452	869	0.75	357,936			13,440,362			
2046	1.56%	272,640	882	0.75	363,520			13,076,843			
2047	1.56%	276,893	896	0.75	369,191			12,707,652			
2048	1.56%	281,213	910	0.75	374,950			12,332,702			
2049	1.56%	285,600	924	0.75	380,799			11,951,902			
2050	1.56%	290,055	939	0.75	386,740			11,565,162			
2051	1.56%	294,580	953	0.75	392,773			11,172,389			
2052	1.56%	299,175	968	0.75	398,900			10,773,489			
2053	1.56%	303,842	983	0.75	405,123			10,368,366			
2054	1.56%	308,582	999	0.75	411,443			9,956,923			
2055	1.56%	313,396	1014	0.75	417,862			9,539,061			
2056	1.56%	318,285	1030	0.75	424,380			9,114,681			
2057	1.56%	323,250	1046	0.75	431,001			8,683,680			
2058	1.56%	328,293	1062	0.75	437,724			8,245,956			
2059	1.56%	333,414	1079	0.75	444,553			7,801,404			
2060	1.56%	338,616	1096	0.75	451,488			7,349,916			
2061	1.56%	343,898	1113	0.75	458,531			6,891,385			
2062	1.56%	349,263	1130	0.75	465,684			6,425,701			
2063	1.56%	354,711	1148	0.75	472,949			5,952,753			
2064	1.56%	360,245	1166	0.75	480,327			5,472,426			
2065	1.56%	365,865	1184	0.75	487,820			4,984,606			
2066	1.56%	371,572	1202	0.75	495,430			4,489,177			
2067	1.56%	377,369	1221	0.75	503,158			3,986,018			
2068	1.56%	383,256	1240	0.75	511,008			3,475,011			
2069	1.56%	389,235	1260	0.75	518,979			2,956,031			
2070	1.56%	395,307	1279	0.75	527,075			2,428,956			
2071	1.56%	401,473	1299	0.75	535,298			1,893,658			
2072	1.56%	407,736	1320	0.75	543,648			1,350,009			
2073	1.56%	414,097	1340	0.75	552,129			797,880			
2074	1.56%	420,557	1361	0.75	560,743			237,137	33,106,474		
2075	1.56%	427,118	1382	0.75	569,490			(332,353)	32,774,121		
2076	1.56%	433,781	1404	0.75	578,374				32,195,747		
2077	1.56%	440,548	1426	0.75	587,397				31,608,350		
2078	1.56%	447,420	1448	0.75	596,560				31,011,790		
2079	1.56%	454,400	1471	0.75	605,867				30,405,923		
2080	1.56%	461,489	1493	0.75	615,318				29,790,605		
2081	1.56%	468,688	1517	0.75	624,917				29,165,688		
2082	1.56%	475,999	1540	0.75	634,666				28,531,022		
2083	1.56%	483,425	1564	0.75	644,567				27,886,456		
2084	1.56%	490,966	1589	0.75	654,622				27,231,834		
2085	1.56%	498,625	1614	0.75	664,834				26,567,000		
2086	1.56%	506,404	1639	0.75	675,205				25,891,794		
2087	1.56%	514,304	1664	0.75	685,739				25,206,056		
2088	1.56%	522,327	1690	0.75	696,436				24,509,620		
2089	1.56%	530,475	1717	0.75	707,300				23,802,319		
2090	1.56%	538,751	1744	0.75	718,334				23,083,985		
2091	1.56%	547,155	1771	0.75	729,540				22,354,445		
2092	1.56%	555,691	1798	0.75	740,921				21,613,523		
2093	1.56%	564,360	1826	0.75	752,480				20,861,044		
2094	1.56%	573,164	1855	0.75	764,218				20,096,825		
2095	1.56%	582,105	1884	0.75	776,140				19,320,685		
2096	1.56%	591,186	1913	0.75	788,248				18,532,437		

Phase 3 Remaining Life from November 2039 = 35.5 years
Phase 3 Anticipated Closure Date = **May 2075**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 3 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024
REVISED: M.Morse DATE: 7/18/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2097	1.56%	600,408	1943	0.75	800,545				17,731,893		
2098	1.56%	609,775	1973	0.75	813,033				16,918,860		
2099	1.56%	619,287	2004	0.75	825,716				16,093,144		
2100	1.56%	628,948	2035	0.75	838,598				15,254,546		
2101	1.56%	638,760	2067	0.75	851,680				14,402,866		
2102	1.56%	648,724	2099	0.75	864,966				13,537,901		
2103	1.56%	658,844	2132	0.75	878,459				12,659,441		
2104	1.56%	669,122	2165	0.75	892,163				11,767,278		
2105	1.56%	679,561	2199	0.75	906,081				10,861,197		
2106	1.56%	690,162	2234	0.75	920,216				9,940,981		
2107	1.56%	700,928	2268	0.75	934,571				9,006,410		
2108	1.56%	711,863	2304	0.75	949,151				8,057,259		
2109	1.56%	722,968	2340	0.75	963,957				7,093,302		
2110	1.56%	734,246	2376	0.75	978,995				6,114,307		
2111	1.56%	745,701	2413	0.75	994,267				5,120,040		
2112	1.56%	757,333	2451	0.75	1,009,778				4,110,262		
2113	1.56%	769,148	2489	0.75	1,025,530				3,084,731		
2114	1.56%	781,147	2528	0.75	1,041,529				2,043,202		
2115	1.56%	793,332	2567	0.75	1,057,777				985,426	8,105,083	
2116	1.56%	805,708	2607	0.75	1,074,278				(88,852)	8,016,231	
2117	1.56%	818,277	2648	0.75	1,091,037					6,925,194	
2118	1.56%	831,043	2689	0.75	1,108,057					5,817,137	
2119	1.56%	844,007	2731	0.75	1,125,343					4,691,795	
2120	1.56%	857,173	2774	0.75	1,142,898					3,548,897	
2121	1.56%	870,545	2817	0.75	1,160,727					2,388,170	
2122	1.56%	884,126	2861	0.75	1,178,834					1,209,336	
2123	1.56%	897,918	2906	0.75	1,197,224					12,111	17,820,792
2124	1.56%	911,926	2951	0.75	1,215,901					(1,203,790)	16,617,002
2125	1.56%	926,152	2997	0.75	1,234,869						15,382,133
2126	1.56%	940,600	3044	0.75	1,254,133						14,128,000
2127	1.56%	955,273	3091	0.75	1,273,697						12,854,303
2128	1.56%	970,175	3140	0.75	1,293,567						11,560,736
2129	1.56%	985,310	3189	0.75	1,313,747						10,246,989
2130	1.56%	1,000,681	3238	0.75	1,334,241						8,912,748
2131	1.56%	1,016,292	3289	0.75	1,355,055						7,557,692
2132	1.56%	1,032,146	3340	0.75	1,376,194						6,181,498
2133	1.56%	1,048,247	3392	0.75	1,397,663						4,783,835
2134	1.56%	1,064,600	3445	0.75	1,419,466						3,364,369
2135	1.56%	1,081,208	3499	0.75	1,441,610						1,922,759
2136	1.56%	1,098,074	3554	0.75	1,464,099						458,660
2137	1.56%	1,115,204	3609	0.75	1,486,939						(1,028,279)

Phase 4 Remaining Life from May 2075 = 41.5 years
Phase 4 Anticipated Closure Date = **November 2116**
Phase 5 Remaining Life from November 2116 = 7.1 years
Phase 5 Anticipated Closure Date = **December 2123**
Phase 6 Remaining Life from December 2123 = 13.3 years
Phase 6 Anticipated Closure Date = **March 2137**

Notes:

(1) Waste growth rate based on BEBR Population Growth Rate (Reference 4).
(2) Tonnages per year taken from Marion County annual material reports (Reference 1).
(3) Average tons per day estimated based on 309 working days in one year.
(4) Remaining volume at the end of the calendar year.

References:

1. Marion County Tonnage Data.
2. CADD File Volume Analysis, Jones Edmunds, February 2024.
3. Historical Lifespan and Capacity Analysis Calculations
4. Projections of Florida Population by County, 2025–2050, with Estimates for 2023, Volume 57, Bulletin 198 of Florida Population Studies, January 2024.

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 1 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024

Objective: To determine the remaining life from present day of the active Baseline Class I Landfill.

1. Calculate the annual population growth rate projections
2. Calculate the anticipated lifespan.

Data:

Starting Annual Waste Disposal Rate =		190,971 Tons	*(Reference 1)*
Phase 1 Disposal Volume Remaining (as of 3/29/2023) =	1,872,881 CY =	1,404,661 tons	*(Reference 2)*
Phase 2 Disposal Volume =	1,689,475 CY =	1,267,106 tons	*(Reference 2)*
Phase 3 Disposal Volume =	15,544,766 CY =	11,658,574 tons	*(Reference 2)*
Phase 4 Disposal Volume =	33,106,474 CY =	24,829,856 tons	*(Reference 2)*
Phase 5 Disposal Volume =	8,105,083 CY =	6,078,812 tons	*(Reference 2)*
Phase 6 Disposal Volume =	17,820,792 CY =	13,365,594 tons	*(Reference 2)*
Lifespan Calculation Start Date =	1/1/2028		

Assumptions:

1. Waste generation growth rates are directly proportional to population growth rates (Attachment 1).
2. Waste apparent density is 1,500 lb/CY, based on historical site-specific data.
3. Waste acceptance in Phase 1 begins January 1, 2028.

Waste density:

$$\rho_i = \frac{Class\ I\ Materials\ Received\ (tons)}{Volume\ Consumed\ (CY)} * (2000 \frac{\text{lbs}}{\text{ton}}) \quad \frac{1500 \text{ lb/CY}}{0.75 \text{ tons/CY}}$$

(Reference 3)

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2023		190,971	618	0.75	254,628						
2024	3.5%	197,655	640	0.75	263,540						
2025	3.5%	204,573	662	0.75	272,764						
2026	3.5%	211,733	685	0.75	282,311						
2027	3.5%	219,144	709	0.75	292,192	1,872,881					
2028	3.5%	226,814	734	0.75	302,418	1,570,463					
2029	3.5%	234,752	760	0.75	313,003	1,257,460					
2030	3.5%	242,969	786	0.75	323,958	933,502					
2031	3.5%	251,472	814	0.75	335,297	598,205					
2032	3.5%	260,274	842	0.75	347,032	251,173	1,689,475				
2033	3.5%	269,384	872	0.75	359,178	(108,005)	1,581,470				
2034	3.5%	278,812	902	0.75	371,749		1,209,721				
2035	3.5%	288,570	934	0.75	384,760		824,961				
2036	3.5%	298,670	967	0.75	398,227		426,733				
2037	3.5%	309,124	1000	0.75	412,165		14,568	15,544,766			
2038	3.5%	319,943	1035	0.75	426,591		(412,022)	15,132,743			
2039	3.5%	331,141	1072	0.75	441,522			14,691,222			
2040	3.5%	342,731	1109	0.75	456,975			14,234,247			
2041	3.5%	354,727	1148	0.75	472,969			13,761,278			
2042	3.5%	367,142	1188	0.75	489,523			13,271,755			
2043	3.5%	379,992	1230	0.75	506,656			12,765,099			
2044	3.5%	393,292	1273	0.75	524,389			12,240,710			

Phase 1 Remaining Life from January 2028 = 5.7 years
Phase 1 Anticipated Closure Date = **September 2033**
Phase 2 Remaining Life from September 2033 = 4.3 years
Phase 2 Anticipated Closure Date = **January 2038**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 2 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2045	3.50%	407,057	1317	0.75	542,743			11,697,967			
2046	3.50%	421,304	1363	0.75	561,739			11,136,229			
2047	3.50%	436,050	1411	0.75	581,400			10,554,829			
2048	3.50%	451,311	1461	0.75	601,749			9,953,081			
2049	3.50%	467,107	1512	0.75	622,810			9,330,271			
2050	3.50%	483,456	1565	0.75	644,608			8,685,663			
2051	3.50%	500,377	1619	0.75	667,169			8,018,494			
2052	3.50%	517,890	1676	0.75	690,520			7,327,973			
2053	3.50%	536,016	1735	0.75	714,688			6,613,285			
2054	3.50%	554,777	1795	0.75	739,703			5,873,582			
2055	3.50%	574,194	1858	0.75	765,592			5,107,990			
2056	3.50%	594,291	1923	0.75	792,388			4,315,602			
2057	3.50%	615,091	1991	0.75	820,121			3,495,481			
2058	3.50%	636,619	2060	0.75	848,826			2,646,655			
2059	3.50%	658,901	2132	0.75	878,535			1,768,121			
2060	3.50%	681,962	2207	0.75	909,283			858,837	33,106,474		
2061	3.50%	705,831	2284	0.75	941,108			(82,271)	33,024,203		
2062	3.50%	730,535	2364	0.75	974,047				32,050,156		
2063	3.50%	756,104	2447	0.75	1,008,139				31,042,018		
2064	3.50%	782,568	2533	0.75	1,043,424				29,998,594		
2065	3.50%	809,957	2621	0.75	1,079,943				28,918,651		
2066	3.50%	838,306	2713	0.75	1,117,741				27,800,910		
2067	3.50%	867,647	2808	0.75	1,156,862				26,644,047		
2068	3.50%	898,014	2906	0.75	1,197,352				25,446,695		
2069	3.50%	929,445	3008	0.75	1,239,260				24,207,435		
2070	3.50%	961,975	3113	0.75	1,282,634				22,924,801		
2071	3.50%	995,645	3222	0.75	1,327,526				21,597,275		
2072	3.50%	1,030,492	3335	0.75	1,373,989				20,223,286		
2073	3.50%	1,066,559	3452	0.75	1,422,079				18,801,206		
2074	3.50%	1,103,889	3572	0.75	1,471,852				17,329,355		
2075	3.50%	1,142,525	3697	0.75	1,523,367				15,805,988		
2076	3.50%	1,182,513	3827	0.75	1,576,685				14,229,303		
2077	3.50%	1,223,901	3961	0.75	1,631,869				12,597,435		
2078	3.50%	1,266,738	4099	0.75	1,688,984				10,908,451		
2079	3.50%	1,311,074	4243	0.75	1,748,098				9,160,353		
2080	3.50%	1,356,961	4391	0.75	1,809,282				7,351,071		
2081	3.50%	1,404,455	4545	0.75	1,872,607				5,478,464		
2082	3.50%	1,453,611	4704	0.75	1,938,148				3,540,316		

Phase 3 Remaining Life from January 2038 = 23.9 years
Phase 3 Anticipated Closure Date = **November 2061**

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 3 of 3
PROJECT NAME: Baseline Landfill Master Planning
SUBJECT: Landfill LIfespan Calculation
BY: M.Morse DATE: 5/23/2024
CHECKED: M.Deaderick DATE: 5/29/2024

Year	Average Waste Growth Rate[1]	Class I Material Received[2] (Tons)	Average Annual Tons per Day[3]	Apparent Density (ton/CY)	Volume Consumed (CY)	Phase 1 Remaining Volume (CY)[4]	Phase 2 Remaining Volume (CY)[4]	Phase 3 Remaining Volume (CY)[4]	Phase 4 Remaining Volume (CY)[4]	Phase 5 Remaining Volume (CY)[4]	Phase 6 Remaining Volume (CY)[4]
2083	3.50%	1,504,487	4869	0.75	2,005,983				1,534,333	8,105,083	
2084	3.50%	1,557,144	5039	0.75	2,076,192				(541,859)	7,563,224	
2085	3.50%	1,611,644	5216	0.75	2,148,859					5,414,364	
2086	3.50%	1,668,052	5398	0.75	2,224,069					3,190,295	
2087	3.50%	1,726,434	5587	0.75	2,301,912					888,384	17,820,792
2088	3.50%	1,786,859	5783	0.75	2,382,479					(1,494,095)	16,326,696
2089	3.50%	1,849,399	5985	0.75	2,465,865						13,860,831
2090	3.50%	1,914,128	6195	0.75	2,552,171						11,308,660
2091	3.50%	1,981,122	6411	0.75	2,641,497						8,667,164
2092	3.50%	2,050,462	6636	0.75	2,733,949						5,933,215
2093	3.50%	2,122,228	6868	0.75	2,829,637						3,103,578
2094	3.50%	2,196,506	7108	0.75	2,928,675						174,903
2095	3.50%	2,273,384	7357	0.75	3,031,178						(2,856,275)

Phase 4 Remaining Life from November 2061 = 22.8 years
Phase 4 Anticipated Closure Date = **September 2084**
Phase 5 Remaining Life from September 2084 = 3.7 years
Phase 5 Anticipated Closure Date = **May 2088**
Phase 6 Remaining Life from May 2088 = 6.7 years
Phase 6 Anticipated Closure Date = **January 2095**

Notes:

(1) Waste growth rate based on recent tonnage rates and County projections.
(2) Tonnages per year taken from Marion County annual material reports (Reference 1).
(3) Average tons per day estimated based on 309 working days in one year.
(4) Remaining volume at the end of the calendar year.

References:

1. Marion County Tonnage Data.
2. CADD File Volume Analysis, Jones Edmunds, February 2024.
3. Historical Lifespan and Capacity Analysis Calculations
4. Projections of Florida Population by County, 2025–2050, with Estimates for 2023, Volume 57, Bulletin 198 of Florida Population Studies, January 2024.

JonesEdmunds

PROJECT NUMBER:	13150-293-01		
PROJECT NAME:	Baseline Landfill Master Planning		
SUBJECT:	Population Projections		
BY:	M.Morse	DATE:	3/4/24
CHECKED BY:	M.Deaderick	DATE:	4/22/2024

POPULATION PROJECTIONS

Projected Population Data

Year	Population		
	Low	Medium	High
2023	403,966	403,966	403,966
2025	392,100	417,100	442,100
2030	401,800	446,400	491,000
2035	406,300	471,100	535,900
2040	406,800	491,700	576,500
2045	405,600	510,200	614,800
2050	402,800	526,500	650,300

Population Projections

Year	Low		Medium		High	
	Population	Growth Rate	Population	Growth Rate	Population	Growth Rate
2023	403,966		403,966		403,966	
2024	398,033	-1.47%	410,533	1.63%	423,033	4.72%
2025	392,100	-1.49%	417,100	1.60%	442,100	4.51%
2026	394,040	0.49%	422,960	1.40%	451,880	2.21%
2027	395,980	0.49%	428,820	1.39%	461,660	2.16%
2028	397,920	0.49%	434,680	1.37%	471,440	2.12%
2029	399,860	0.49%	440,540	1.35%	481,220	2.07%
2030	401,800	0.49%	446,400	1.33%	491,000	2.03%
2031	402,700	0.22%	451,340	1.11%	499,980	1.83%
2032	403,600	0.22%	456,280	1.09%	508,960	1.80%
2033	404,500	0.22%	461,220	1.08%	517,940	1.76%
2034	405,400	0.22%	466,160	1.07%	526,920	1.73%
2035	406,300	0.22%	471,100	1.06%	535,900	1.70%
2036	406,400	0.02%	475,220	0.87%	544,020	1.52%
2037	406,500	0.02%	479,340	0.87%	552,140	1.49%
2038	406,600	0.02%	483,460	0.86%	560,260	1.47%
2039	406,700	0.02%	487,580	0.85%	568,380	1.45%
2040	406,800	0.02%	491,700	0.84%	576,500	1.43%
2041	406,560	-0.06%	495,400	0.75%	584,160	1.33%
2042	406,320	-0.06%	499,100	0.75%	591,820	1.31%
2043	406,080	-0.06%	502,800	0.74%	599,480	1.29%
2044	405,840	-0.06%	506,500	0.74%	607,140	1.28%
2045	405,600	-0.06%	510,200	0.73%	614,800	1.26%
2046	405,040	-0.14%	513,460	0.64%	621,900	1.15%
2047	404,480	-0.14%	516,720	0.63%	629,000	1.14%
2048	403,920	-0.14%	519,980	0.63%	636,100	1.13%
2049	403,360	-0.14%	523,240	0.63%	643,200	1.12%
2050	402,800	-0.14%	526,500	0.62%	650,300	1.10%
Average [2]	0.11%		0.94%		1.56%	

Notes:

1. Population projections based on Florida population Studies, BEBR.
2. Compounded annual average population growth from 2025 to 2050.

MARION COUNTY BCC SOLID WASTE

Material Report

Transactions from 10/01/2022 through 09/30/2023
Inbound and Outbound Tickets
Third Party and Intercompany Customers
Recycle and Disposal Material
Material Summary

Reference #1

	Bill Units	Cubic Yards	Tons	Est Tons	Tax	Disposal Amount	Amount
0 - OUTBOUND GARBAGE *4,196 tickets and 4,196 transactions*	193,720.32 TON	0.00	193,720.32	0.00	$0.00	$0.00	$0.00
1 - CLASS 1-CHARGEABLE *1,494 tickets and 1,494 transactions*	11,510.69 TON	0.00	11,510.69	0.00	$0.00	$517,981.05	$517,981.05
2 - CLASS 3-CHARGEABLE *72,013 tickets and 72,013 transactions*	51,462.48 TON	0.00	51,462.48	0.00	$0.00	$2,342,785.05	$2,342,785.05
5 - SPECIAL HANDLING *11 tickets and 11 transactions*	13.82 TON	0.00	13.82	0.00	$0.00	$1,382.00	$1,382.00
6 - TIRES/NO CHARGE *579 tickets and 579 transactions*	664.50 TON	0.00	664.50	0.00	$0.00	$0.00	$0.00
8 - TIRES-CHARGEABLE/PSNGR & LT DUTY *1,829 tickets and 1,829 transactions*	1,761.93 TON	0.00	1,761.93	0.00	$0.00	$257,362.38	$257,362.38
9 - METALS-CHARGEABLE *11 tickets and 11 transactions*	2.75 TON	0.00	2.75	0.00	$0.00	$128.35	$128.35
10 - OFF ROAD/OVERSIZE TIRES-CHARGEABLE *211 tickets and 211 transactions*	128.98 TON	0.00	128.98	0.00	$0.00	$34,201.15	$34,201.15
11 - LATEX PAINT-NO CHARGE *49 tickets and 49 transactions*	221.31 TON	0.00	221.31	0.00	$0.00	$0.00	$0.00
13 - WHOLE TIRES-OUTBOUND *281 tickets and 281 transactions*	2,652.18 TON	0.00	2,652.18	0.00	$0.00	$0.00	$0.00
15 - OUTBOUND MULCH *1,114 tickets and 1,114 transactions*	28,750.58 TON	0.00	28,750.58	0.00	$0.00	$0.00	$0.00
16 - CLASS 1-NO CHARGE *14,719 tickets and 14,719 transactions*	115,264.43 TON	0.00	115,264.43	0.00	$0.00	$322.65	$322.65
17 - YARD WASTE-NO CHARGE *2,198 tickets and 2,198 transactions*	10,340.55 TON	0.00	10,340.55	0.00	$0.00	$0.00	$0.00
18 - SITE RECOVERY /RECYCLED *152 tickets and 152 transactions*	167.74 TON	0.00	167.74	0.00	$0.00	$0.00	$0.00
20 - CLASS 3-NO CHARGE *2,677 tickets and 2,677 transactions*	4,534.45 TON	0.00	4,534.45	0.00	$0.00	$0.00	$0.00
21 - WEIGHT ONLY *9 tickets and 9 transactions*	56.40 TON	0.00	56.40	0.00	$0.00	$0.00	$0.00
22 - YARD WASTE-CHARGEABLE *20,750 tickets and 20,750 transactions*	22,369.77 TON	0.00	22,369.77	0.00	$0.00	$567,604.50	$567,604.50

MARION COUNTY BCC SOLID WASTE

Material Report

Transactions from 10/01/2022 through 09/30/2023
Inbound and Outbound Tickets
Third Party and Intercompany Customers
Recycle and Disposal Material
Material Summary

Reference #1

User ID: WP

	Bill Units	Cubic Yards	Tons	Est Tons	Tax	Disposal Amount	Amount
29 - ELECTRONIC WASTE *142 tickets and 142 transactions*	462.26 TON	0.00	462.26	0.00	$0.00	$0.00	$0.00
31 - LEACHATE COLLECTION *505 tickets and 505 transactions*	17,628.43 TON	0.00	17,628.43	0.00	$0.00	$0.00	$0.00
32 - YARD WASTE-BCC-DISCOUNTED *1,059 tickets and 1,059 transactions*	5,326.31 TON	0.00	5,326.31	0.00	$0.00	$98,272.50	$98,272.50
40 - APPLIANCES-NO CHARGE *3 tickets and 3 transactions*	5.25 TON	0.00	5.25	0.00	$0.00	$0.00	$0.00
41 - METAL-NO CHARGE *191 tickets and 191 transactions*	997.85 TON	0.00	997.85	0.00	$0.00	$0.00	$0.00
50 - METAL/RECYCLING *1,130 tickets and 1,130 transactions*	3,665.49 TON	0.00	3,665.49	0.00	$0.00	$0.00	$0.00
62 - SINGLE STREAM/RECYCLING *1,025 tickets and 1,025 transactions*	3,322.16 TON	0.00	3,322.16	0.00	$0.00	$0.00	$0.00
65 - RESIDENTIAL SS RECYCLING *369 tickets and 369 transactions*	1,463.69 TON	0.00	1,463.69	0.00	$0.00	$0.00	$0.00
70 - COMMERCIAL PAINT *60 tickets and 60 transactions*	23.56 TON	0.00	23.56	0.00	$0.00	$11,780.00	$11,780.00
CAR - SMALL CAR *714 tickets and 714 transactions*	721.00 EA	0.00	0.00	36.05	$0.00	$3,605.00	$3,605.00
TRK - TRUCK/VAN/SUV *21,316 tickets and 21,316 transactions*	21,395.00 EA	0.00	0.00	5,348.75	$0.00	$213,950.00	$213,950.00
Report Grand Totals		0.00	476,517.88	5,384.80	$0.00	$4,049,374.63	$4,049,374.63

148,807 tickets and 148,807 transactions

End of Report

Reference #2

13150-293-01 Marion County Landfill Expansion						
Date Requested: 2-7-2024						
Volume Requested by: Mark Hadlock						
Volume Performed By: Paul Upstill						
Volume QC Performed By:						
Surface Notes						
1. EG-SM = 3-29-2023 survey from Ingenae and Coastal Land Surveyors and Mappers.						
2, PG-URB-BOT = Contours shown in Figures for 6:1 excavations in urban Cell.						
3. TOW-URB-BOT = PG-URB-BOT merged with Ph 1 top of waste elevations only over Urban Cell.						
4. TOW-PH-1-BOT = TOW-URB-BOT merged with Cell III Permitted Final Cover.						
5. TOW-PH-1 = Modified Cell III and Urban Cell Conceptual Final Cover lowered 2 feet.						
6. PG-PH-2-BOT = South Celll Bottom Liner.						
6. PG-PH-2-PH-1-BOT = PG-PH-2-COVR merged with PG-PH-2-BOT.						
7. TOW-PH-2 = Final Cover grades over South Cell lowered 2 feet.						
Volume Drawings Used						
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Volumes						
PH 1 Index	Base Surface	Comparison Surface	Cut	Fill	Net	
1	EG-SM	PG-URB-BOT	157289.99 Cu. Yd.	17702.98 Cu. Yd.	139587.01 Cu. Yd.<Cut>	
2	EG-SM	TOW-URB-BOT	165148.79 Cu. Yd.	139559.63 Cu. Yd.	25589.16 Cu. Yd.<Cut>	
3	TOW-PH-1-BOT	TOW-PH-1	94391.16 Cu. Yd.	1946955.06 Cu. Yd.	1852563.90 Cu. Yd.<Fill>	
PH 2 Index	Base Surface	Comparison Surface	Cut	Fill	Net	
1	PG-PH-2-PH-1-BOT	TOW-PH-2	2498.89 Cu. Yd.	2042782.79 Cu. Yd.	2040283.89 Cu. Yd.<Fill>	
PH 3 Index	Base Surface	Comparison Surface	Cut	Fill	Net	
1	PG-PH-3-PH-2-PH-1-E	TOW-PH-3	662.46 Cu. Yd.	15788739.91 Cu. Yd.	15788077.44 Cu. Yd.<Fill>	
Ph 1 Areas	**FC**					
	2D surface area	2890816.59 Sq. Ft.				
	3D surface area	3036066.72 Sq. Ft.				
Ph 2 Areas	**FC**					
	2D surface area	1324396.35 Sq. Ft.				
	3D surface area	1390922.40 Sq. Ft.				
Ph 3 Areas	**FC**					
	2D surface area	3773998.29 Sq. Ft.				
	3D surface area	3930755.33 Sq. Ft.				

Reference #2

13150-293-01 Marion County Landfill Expansion

Date Requested: 2-7-2024

Volume Requested by: Mark Hadlock

Volume Performed By: Paul Upstill

Volume QC Performed By:

Surface Notes

1. EG-SM = 3-29-2023 survey from Ingenae and Coastal Land Surveyors and Mappers.
2, PG-URB-BOT = Contours shown in Figures for 6:1 excavations in urban Cell.
3. TOW-URB-BOT = PG-URB-BOT merged with Ph 1 top of waste elevations only over Urban Cell.
4. TOW-PH-1-BOT = TOW-URB-BOT merged with Cell III Permitted Final Cover.
5. TOW-PH-1 = Modified Cell III and Urban Cell Conceptual Final Cover lowered 2 feet.
6. PG-PH-2-BOT = South Celll Bottom Liner.
6. PG-PH-2-PH-1-BOT = PG-PH-2-COVR merged with PG-PH-2-BOT.
7. TOW-PH-2 = Final Cover grades over South Cell lowered 2 feet.
8. EG-SM-PLUS = EG-SM expanded to the Admin areas.

Volume Drawings Used

\\Jea.net\pan02\WORKSPACE\13150-Marion County\Projects\293-01_Landfill_Epansion\CAD_Data\Quantities\20240207\(2)13150293vol20240207.dw

Volumes

Index	Base Surface	Comparison Surface	Cut	Fill	Net
1	PG-PH-2-PH-1-BOT	TOW-PH-2	2911.70 Cu. Yd.	1731255.83 Cu. Yd.	1728344.13 Cu. Yd.<Fill>
2	EG-SM-PLUS	PG-PH-2-BOT	441844.92 Cu. Yd.	115.91 Cu. Yd.	441729.00 Cu. Yd.<Cut>

Ph 2 Areas	**FC**	
	2D surface area	1276601.18 Sq. Ft.
	3D surface area	1341226.05 Sq. Ft.

Reference #2

13150-293-01 Marion County Landfill Expansion

Date Requested: 2-7-2024

Volume Requested by: Mark Hadlock

Volume Performed By: Paul Upstill

Volume QC Performed By:

Surface Notes

1. EG-SM = 3-29-2023 survey from Ingenae and Coastal Land Surveyors and Mappers.
2, PG-URB-BOT = Contours shown in Figures for 6:1 excavations in urban Cell.
3. TOW-URB-BOT = PG-URB-BOT merged with Ph 1 top of waste elevations only over Urban Cell.
4. TOW-PH-1-BOT = TOW-URB-BOT merged with Cell III Permitted Final Cover.
5. TOW-PH-1 = Modified Cell III and Urban Cell Conceptual Final Cover lowered 2 feet.
6. PG-PH-2-BOT = South Celll Bottom Liner.
6. PG-PH-2-PH-1-BOT = PG-PH-2-COVR merged with PG-PH-2-BOT.
7. TOW-PH-2 = Final Cover grades over South Cell lowered 2 feet.
8. EG-PH-3-76 = Elevation at 76.0

Volume Drawings Used

\\Jea.net\pan02\WORKSPACE\13150-Marion County\Projects\293-01_Landfill_Epansion\CAD_Data\Quantities\20240207\(3)13150293vol20240207.dw

Volumes

Index	Base Surface	Comparison Surface	Cut	Fill	Net
1	EG-PH-3-76	PG-PH-3-BOT	2438967.80 Cu. Yd.	28166.20 Cu. Yd. NA	2410801.60 Cu. Yd.<Cut> NA
2	PG-PH-3-PH-2-PH-1-E	TOW-PH-3	642.30 Cu. Yd. NA	15740693.20 Cu. Yd.	15740050.90 Cu. Yd.<Fill> NA

Ph 3 Areas	**FC**				
	2D surface area	3855610.80 Sq. Ft.			
	3D surface area	4012115.86 Sq. Ft.			

Reference #2

13150-293-01 Marion County Landfill Expansion

Date Requested: 2-7-2024

Volume Requested by: Mark Hadlock

Volume Performed By: Paul Upstill

Volume QC Performed By:

Surface Notes

1. EG-SM = 3-29-2023 survey from Ingenae and Coastal Land Surveyors and Mappers.
2, PG-URB-BOT = Contours shown in Figures for 6:1 excavations in urban Cell.
3. TOW-URB-BOT = PG-URB-BOT merged with Ph 1 top of waste elevations only over Urban Cell.
4. TOW-PH-1-BOT = TOW-URB-BOT merged with Cell III Permitted Final Cover.
5. TOW-PH-1 = Modified Cell III and Urban Cell Conceptual Final Cover lowered 2 feet.
6. PG-PH-2-BOT = South Cell Bottom Liner.
6. PG-PH-2-PH-1-BOT = PG-PH-2-COVR merged with PG-PH-2-BOT.
7. TOW-PH-2 = Final Cover grades over South Cell lowered 2 feet.
8. EG-PH-3-76 = Elevation at 76.0
9. EG-PH-4-76 = Elevation at 76.0
9. PG-PH-4-BOT = Sotuhwest Cell Bottom Liner
10. TOW-PH-4 = PG-PH-4-COVR lowered 2 feet

Volume Drawings Used

\\Jea.net\pan02\WORKSPACE\13150-Marion County\Projects\293-01_Landfill_Epansion\CAD_Data\Quantities\20240212\(4)13150293vol20240212.dw

Volumes

Index	Base Surface	Comparison Surface	Cut	Fill	Net
1	EG-PH-4-76	PG-PH-4-BOT	6267125.02 Cu. Yd.	0.00 Cu. Yd.	6267125.02 Cu. Yd.<Cut>
2	PG-PH-4-BOT	TOW-PH-4	0.00 Cu. Yd.	33555575.09 Cu. Yd.	33555575.09 Cu. Yd.<Fill>

Ph 4 Areas	FC	
	2D surface area	6062424.29 Sq. Ft.
	3D surface area	6308724.39 Sq. Ft.

Reference #2

13150-293-01 Marion County Landfill Expansion

Date Requested: 4-10-2024
Volume Requested by: Matthew Morse
Volume Performed By: Paul Upstill
Volume QC Performed By:

Surface Notes

1. EG-SM = 3-29-2023 survey from Ingenae and Coastal Land Surveyors and Mappers.
2, PG-URB-BOT = Contours shown in Figures for 6:1 excavations in urban Cell.
3. TOW-URB-BOT = PG-URB-BOT merged with Ph 1 top of waste elevations only over Urban Cell.
4. TOW-PH-1-BOT = TOW-URB-BOT merged with Cell III Permitted Final Cover.
5. TOW-PH-1 = Modified Cell III and Urban Cell Conceptual Final Cover lowered 2 feet.
6. PG-PH-2-BOT = South Cell Bottom Liner.
6. PG-PH-2-PH-1-BOT = PG-PH-2-COVR merged with PG-PH-2-BOT.
7. TOW-PH-2 = Final Cover grades over South Cell lowered 2 feet.
8. EG-PH-3-76 = Elevation at 76.0
9. EG-PH-4-76 = Elevation at 76.0
9. PG-PH-4-BOT = Southwest Cell Bottom Liner
10. TOW-PH-4 = PG-PH-4-COVR lowered 2 feet
11.EG-PH-6-76 = Elevation at 76.0.
12. EG-DRA-76 = Elevation at 76.0.

Volume Drawings Used

\\Jea.net\pan02\WORKSPACE\13150-Marion County\Projects\293-01_Landfill_Epansion\CAD\Figures\Xref\xr293-DSGN-PH-5.dwg
\\Jea.net\pan02\WORKSPACE\13150-Marion County\Projects\293-01_Landfill_Epansion\CAD\Figures\Xref\xr293-DSGN-PH-6.dwg

Volumes

Index	Base Surface	Comparison Surface	Cut	Fill	Net			
1	PG-DRA1-TOP	PG-DRA1	356759.00 Cu. Yd.	0.00 Cu. Yd.	356759.00 Cu. Yd.<Cut>			
2	PG-DRA3-TOP	PG-DRA3	148377.64 Cu. Yd.	0.00 Cu. Yd.	148377.64 Cu. Yd.<Cut>			
3	PG-DRA4-TOP	PG-DRA4	168841.71 Cu. Yd.	0.00 Cu. Yd.	168841.71 Cu. Yd.<Cut>			
						Phase 5 Drainage Soil Volume =	168,129	CY
4	PG-PH-5-PH-4-BOT	TOW-PH-5	372.45 Cu. Yd.	8240571.78 Cu. Yd.	8240199.33 Cu. Yd.<Fill>	Phase 5 Waste Volume =	8,072,443	CY
~~5~~	~~PG-PH-6-BOT~~	~~TOW-PH-6~~	~~542951.60 Cu. Yd.~~	~~3861401.27 Cu. Yd.~~	~~3318449.67 Cu. Yd.<Fill>~~	Phase 6 Drainage Soil Volume =	640,675	CY
5	PG-PH-6-BOT	TOW-PH-6	758472.50 Cu. Yd.	17869449.77 Cu. Yd.	17110977.27 Cu. Yd.<Fill>	Phase 6 Waste Volume =	17,228,775	CY
6	PG-PH-6-BOT	TOW-PH-7	577325.42 Cu. Yd.	36455124.37 Cu. Yd.	35877798.96 Cu. Yd.<Fill>			
7	EG-PH-5-76	PG-PH-5-BOT	1722438.67 Cu. Yd.	0.00 Cu. Yd.	1722438.67 Cu. Yd.<Cut>			
8	EG-PH-6-76	PG-PH-6-BOT	329034.40 Cu. Yd.	143477.82 Cu. Yd.	185556.58 Cu. Yd.<Cut>			

Areas

	PH 5 FC				
	2D surface area	2269744.72 Sq. Ft.	2269744.72	SF	
	3D surface area	2385872.45 Sq. Ft.	2385872.45	SF	
	PH 6 FC				
	2D surface area	8649109.93 Sq. Ft.	8649109.93	SF	
	3D surface area	9088815.81 Sq. Ft.	9088815.81	SF	
	PH 7 FC				
	2D surface area	14599863.42 Sq. Ft.			
	3D surface area	15307555.53 Sq. Ft.			

PROJECT NUMBER:	13150-245-01		
PROJECT NAME:	Baseline Landfill Survey and Capacity Analysis		
SUBJECT:	Capacity and Design Life Calculations		
BY:	J. Toms	DATE:	5/31/17
CHECKED BY:	R. Bhula/J. Woolsey	DATE:	6/6/17

Reference #3 (excerpt)

Objective:

1. Calculate the Starting Annual Waste Disposal Rate.
2. Calculate the annual BEBR Population Growth Rate Projections.
3. Calculate the waste to volume ratio (waste density) based on actual waste tonnage disposed between surveys.
4. Calculate the annual waste disposal projections and remaining landfill volume.
5. Calculate the remaining design life for Baseline Landfill.

Data:

	Capacity Analysis Timeperiod Starting Date =	3/19/2015		*Referred to as 2015*
	Capacity Analysis Timeperiod Ending Date =	4/18/2017		*Referred to as 2017*
V_T =	Total Volume Increase during Timeperiod =	361,685	CY	*(Reference 1)*
V_R =	Disposal Volume Remaining =	506,859	CY	*(Reference 1)*
W_T =	Total Tonnage Disposed during Timeperiod =	284,408	Tons	*(Reference 2)*

Calculations:

1. Calculate the starting annual waste disposal rate.

$RD = (WT/T) \times (365 \text{ days/yr})$

Where:

R_D =	Starting Annual Waste Disposal Rate			
W_T =	Total Tonnage Disposed during Timeperiod	284,408	Tons	*(Reference 2)*
T =	Length of Timeperiod	761	Days	
R_D =	***284408 Tons / 761 days x (365 days/yr) =***	**136,000**	**Tons/yr**	(Rounded)

2. Estimate the future annual growth rate based on BEBR medium population projections. *(Reference 3)*

2017 BEBR Population Projections

Year	Population
2017	345,749
2020	367,500
2025	392,800
2030	414,800
2035	434,700
2040	452,000

Population Increase

Year	Population	Growth Rate
2017	345,749	
2018	352,852	2.1%
2019	360,102	2.1%
2020	367,500	2.1%
2021	372,426	1.3%
2022	377,418	1.3%
2023	382,477	1.3%
2024	387,604	1.3%
2025	392,800	1.3%

Note: 2017, 2020, and 2025 population data based on data from University of Florida Bureau of Economic and Business Research (BEBR), Florida County Population Projections (Released April 2017). All other years are interpolated.

3. Calculate the waste to volume ratio (waste density) based on actual waste tonnage disposed between surveys.

$\sigma_a = W_T/V_T$

Where:

σ_a =	Waste to Volume Ratio			
V_T =	Total Volume Increase during Timeperiod	361,685	CY	*(Reference 1)*
W_T =	Total Tonnage Disposed during Timeperiod	284,408	Tons	*(Reference 3)*
σ_a =	**284408 Tons / 361685 CY =**	**0.79**	***tcy***	***1,580 pcy***
σ =	***Waste Density used for Lifespan Calcs =**	**0.76**	***tcy***	***1,520 pcy***

College of Liberal Arts and Sciences
Bureau of Economic and Business Research

Reference #4
(excerpt)

BEBR

Volume 57, Bulletin 198
January 2024

Florida Population Studies

Projections of Florida Population by County, 2025–2050, with Estimates for 2023

Stefan Rayer, Population Program Director
Conor Comfort, Research Demographer

The Bureau of Economic and Business Research (BEBR) at the University of Florida has produced population projections for Florida and its counties since the 1970s. This report presents our 2024 set of projections and describes the methodology used to construct those projections. To account for uncertainty regarding future population growth, we publish three series of projections – low, medium, and high. We recommend using the medium series for most purposes; this series has historically provided the most accurate forecasts for Florida counties. It should be noted that these projections refer solely to the resident population of Florida; they do not include temporary or seasonal residents whose usual place of residence is in another jurisdiction.

State Projections

The starting point for the state-level projections was the decennial census count for April 1, 2020. Projections were made in one-year intervals using a cohort-component methodology in which births, deaths, and migration are projected separately for each age-sex cohort in Florida.

Survival rates were applied by single year of age and sex to project future deaths in the population. These rates were based on Florida Life Tables for 2012–2018, using mortality data published by the Office of Vital Statistics in the Florida Department of Health. We adjusted the survival rates for 2020–2028 to make them consistent with recent mortality trends, and to align the projected deaths with those from the State of Florida's Demographic Estimating Conference (DEC) held November 28, 2023. After 2028, we made small adjustments to the survival rates based on projected changes in survival rates released by the U.S. Census Bureau.

Domestic migration rates by age and sex were based on Public Use Microdata Sample (PUMS) files from the 2011–2019 American Community Survey (ACS) 1-year estimates and 2015–2019 ACS 5-year estimates. We calculated an average of those two sets of migration estimates; projections based on input data from more than one period tend to be more accurate than those based on a single period. By combining 1-year ACS estimates, which are more current, with 5-year ACS estimates, which are more stable, we make use of the different strengths of each type of ACS data.

We applied smoothing techniques to the migration rates by single year of age and sex to adjust for data irregularities caused by small sample sizes. The smoothed in- and out-migration rates were weighted to account for recent changes in Florida's population growth rates. Projections of domestic in-migration were made by applying weighted in-migration rates to the projected population of the United States (minus Florida), using the most recent set of national projections produced by the U.S. Census Bureau. Projections of out-migration were made by applying weighted out-migration rates to the Florida population. In both instances, rates were calculated separately for males and females for each age up to 90 and over.

Projections of Florida Population by County, 2025–2050, with 023

Reference #4 (excerpt)

County and State	Estimates April 1, 2023	Projections, April 1 2025	2030	2035	2040	2045	2050
HOLMES	19,910						
Low		18,800	18,100	17,400	16,700	16,100	15,600
Medium		20,000	20,100	20,200	20,200	20,300	20,300
High		21,200	22,100	22,900	23,700	24,400	25,100
INDIAN RIVER	167,781						
Low		161,000	163,200	162,700	159,800	156,100	152,200
Medium		173,100	184,400	193,100	199,200	204,100	208,400
High		185,200	205,600	223,500	238,500	252,000	264,700
JACKSON	48,982						
Low		46,800	45,600	44,300	43,100	42,000	41,000
Medium		49,300	49,800	50,300	50,600	50,900	51,200
High		51,700	54,100	56,200	58,100	59,800	61,400
JEFFERSON	15,402						
Low		14,700	14,400	14,100	13,700	13,300	13,000
Medium		15,600	16,000	16,300	16,600	16,800	17,000
High		16,500	17,600	18,500	19,400	20,200	21,000
LAFAYETTE	8,074						
Low		7,700	7,600	7,400	7,200	7,000	6,800
Medium		8,200	8,400	8,600	8,700	8,800	8,900
High		8,700	9,300	9,800	10,200	10,600	11,000
LAKE	414,749						
Low		404,400	423,500	432,700	434,700	433,200	430,100
Medium		434,900	478,500	513,600	541,700	566,300	589,200
High		465,300	533,500	594,500	648,700	699,300	748,300
LEE	800,989						
Low		785,700	817,600	831,800	833,100	828,700	822,400
Medium		835,900	908,500	964,400	1,006,700	1,042,400	1,075,100
High		886,000	999,300	1,097,000	1,180,400	1,256,200	1,327,700
LEON	301,724						
Low		291,300	290,200	287,800	283,700	279,100	274,600
Medium		306,600	317,200	326,100	332,700	338,300	343,300
High		322,000	344,100	364,400	381,800	397,400	412,000
LEVY	45,283						
Low		43,500	43,500	43,200	42,500	41,800	41,000
Medium		46,200	48,300	50,000	51,400	52,500	53,600
High		49,000	53,200	56,900	60,200	63,300	66,100
LIBERTY	7,977						
Low		7,500	7,300	7,000	6,800	6,600	6,300
Medium		8,000	8,100	8,200	8,200	8,300	8,300
High		8,500	8,900	9,300	9,600	9,900	10,200
MADISON	18,698						
Low		17,600	16,900	16,300	15,600	15,100	14,500
Medium		18,700	18,800	18,900	18,900	18,900	19,000
High		19,900	20,700	21,500	22,200	22,800	23,400
MANATEE	439,566						
Low		427,300	445,200	455,000	455,900	453,000	448,600
Medium		459,500	503,100	540,100	568,100	592,200	614,600
High		491,600	561,000	625,100	680,300	731,300	780,500
MARION	403,966						
Low		392,100	401,800	406,300	406,800	405,600	402,800
Medium		417,100	446,400	471,100	491,700	510,200	526,500
High		442,100	491,000	535,900	576,500	614,800	650,300
MARTIN	162,847						
Low		155,800	154,900	153,000	150,000	146,800	143,700
Medium		165,700	172,100	177,400	181,300	184,700	187,800
High		175,700	189,300	201,700	212,600	222,500	232,000

Appendix C

Preliminary Analysis of Geotechnical Investigation

GEOHAZARDS™

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PRELIMINARY ANALYSIS OF GEOTECHNICAL INVESTIGATION AND REMEDIATION PLAN FOR THE MARION COUNTY BASELINE LANDFILL EXPANSION

Task Order 1, Task 5

April 18, 2024

Prepared for:

Marion County
Mark Johnson, Director, Solid Waste
5601 SE 66th Street
Ocala, Florida 34480

100 SW 75th St., Ste, 201, Gainesville FL 32607 Telephone: 800.770.9990 Admin@Geohazards.com

Table of Contents

SUMMARY OF UNDERSTANDING REGARDING TASK ORDER 1, TASK 5

Task 5: Geohazards was assigned to review the costs of geotechnical improvements performed as part of the original lined Cells III-B and III-C construction. These outdated costs will be revised for current estimated prices based on the scope of previous work required in the aforementioned cells.

The main topics for review include prior Baseline site improvement plans, remediation approaches and final completion reports, and geology analysis methods used and current testing and remediation methodologies.

DOCUMENT REVIEW

Geohazards has reviewed the following documents provided by Jones Edmunds.

Phase III-B

Geotechnical Study – Baseline Landfill, Marion County Florida. Jammal & Associates. August 19, 1987. 21 pages.

Report of the Geophysical Investigation of the Geological Subsurface at the Marion County Baseline Sanitary Landfill. Geohazards Inc. September 5, 1989. 132 pages.

Geophysical Investigation of the Geological Subsurface at Baseline Sanitary Landfill, Ocala, Marion County, Florida. Geohazards Inc. October 19, 1989. 18 pages.

Support of Landfill Liner Over Potential Sinkhole Voids in Ocala Landfill Area IIIB. Schmertmann & Crapps, Inc. November 22, 1989. 20 pages.

Volume 1 – Marion County Baseline Landfill – Permit Application and Engineering Report. Jones Edmunds & Associates. November 1989. 89 pages.

Volume 1 – Marion County Baseline Landfill – Permit Application and Engineering Report – Construction Drawings, Technical Specifications and Engineering Report. Jones Edmunds & Associates. December 8, 1989. 501 pages.

Volume II – Marion County Baseline Landfill Hydrogeologic Investigation and Groundwater Monitoring Plan for the Baseline Landfill. Jones Edmunds & Associates. November 1989, 202 pages.

Volume II – Marion County Baseline Landfill Hydrogeologic Investigation and Groundwater Monitoring Plan for the Baseline Landfill. Jones Edmunds & Associates. February 1990, 177 pages.

Marion County Baseline Landfill – Florida Department of Environmental Regulation Response to Request for Additional Information. Jones Edmunds & Associates. February 2, 1990. 35 pages.

Resistivity Survey and Soil Borings, Schematics, Baseline Expansion Cell III-B. Jones Edmunds & Associates. February 1990. 4 pages.

Marion County Baseline Landfill Response to Request for Additional Information letter dated 01/05/90. Jones Edmunds & Associates. February 2, 1990. 212 pages.

Marion County Baseline Landfill Phase III-B Expansion Construction Permit Application No. SC42-173589 Response to Request for Additional Information letter dated 03/06/90. Jones Edmunds & Associates. March 27, 1990. 11 pages.

Baseline Landfill Phase III-B Surface Map. Jones Edmunds & Associates. March 1990. 1 page.

Marion County Baseline Landfill Phase III-B Expansion Schematics – Primary Grout Areas and Grout Points. Jones Edmunds & Associates April 1990. 5 pages.

Development of Baseline III-B Grouting Plan for Sinkhole and Settlement Remediation. Schmertmann & Crapps, Inc. May 3, 1990. 44 pages.

Development of Baseline III-B Grouting Plan for Sinkhole and Settlement Remediation. Report No. 2. Schmertmann & Crapps, Inc. May 3, 1990. 98 pages.

Baseline Landfill Phase III-B Marion County Subsurface Investigation and Grouting Plan. Schmertmann & Crapps, Inc. May 6, 1990. 213 pages.

Addendum 1 to Draft Report of 3 May 90, titled "Development of Baseline III-B Grouting Plan for Sinkhole and Settlement Remediation". Schmertmann & Crapps, Inc. June 5, 1990. 9 pages.

Marion County Baseline Landfill Phase III-B Expansion Meeting Minutes re: Grouting. Jones Edmunds & Associates. June 7, 1990. 6 pages.

Compaction Grouting Stabilizes Landfill Foundation. Leland W. Parker, Jones Edmunds & Associates, Project Manager, Marion County Baseline Landfill. September 6, 1991. 27 pages.

Geological Report for Compaction Grouting Program of Cell III-B Marion County Baseline Landfill. Jones Edmunds & Associates. November 1990. 32 pages.

Marion County Baseline Landfill Cell III-B Grouting Completion Report. Schmertmann & Crapps, Inc. November 27, 1990. 194 pages.

Compaction Grout Program, Completion Report. Marion County Baseline Landfill Phase III-B Expansion. Jones Edmunds & Associates. November 28, 1990. 202 pages.

Final Grout Points and Test Boring Locations for Area 1. Phase III-B Expansion. Jones Edmunds & Associates. November 1990. 1 page.

Geological Report for Compaction Grouting Program of Cell III-B Marion County Baseline Landfill. (includes Dr. Spangler (UF) Report). Jones Edmunds & Associates. November 1990. 133 pages.

Baseline Geologic Cross Section III-B. Jones Edmunds & Associates. undated. 5 pages.

Phase III-C

Baseline Landfill Phase III-C Expansion Test Borings Results memo. Allan Biddlecomb. PSI/ Jammal & Assoc Drillers. May 9, 1993. 62 pages.

Marion County Baseline Landfill Phase III-C Permit Application Volume I of V – Permit Application and Engineering Report. Jones Edmunds & Associates. September 1993. 202 pages.

Marion County Baseline Landfill Phase III-C Permit Application Volume II of V – Subsurface Investigation and Reports. Jones Edmunds & Associates. September 1993. 139 pages.

Marion County Baseline Landfill Phase III-C Permit Application Volume III of V – Hydrogeological Report and Groundwater Monitoring Plan. Jones Edmunds & Associates. September 1993. 162 pages.

Marion County Baseline Landfill Phase III-C Permit Application Volume IV of V – Baseline Landfill Operation Plan. Jones Edmunds & Associates. September 1993. 97 pages.

Marion County Baseline Landfill Phase III-C Permit Application Volume V of V – Construction Quality Assurance Plan. Jones Edmunds & Associates. September 1993. 256 pages.

Marion County Baseline Landfill Phase III-C Expansion Schematics "Final Cover and Stormwater Management Plan". Jones Edmunds & Associates. September,1993. 5 pages.

Marion County Baseline Landfill Phase III-C Expansion Permit Application – FDEP October 19, 1993 – Request for Additional Information. Jones Edmunds & Associates. December 12, 1993. 141 pages.

Marion County Baseline Landfill Phase III-C Expansion – Modified Compaction Grouting Program Drawing – Grout Points, SPT, CPT, and CTL Locations. February 8, 1994. 2 pages.

Marion County Baseline Landfill Phase III-C Expansion Construction Drawings. Jones Edmunds & Associates. March 1994. 30 pages.

Marion County Baseline Landfill Phase III-C Expansion – Modified Compaction Grouting Program – Volume I of II – Geological Completion Report, Jones Edmunds & Associates. July 1995. 121 pages.

Marion County Baseline Landfill Phase III-C Expansion – Modified Compaction Grouting Program – Volume II of II – Geological Completion Report. Jones Edmunds & Associates. June 1996. 18 pages.

Marion County Baseline Landfill Cells III-A and III-B Closure. Jones Edmunds & Associates. August 1997. 9 pages.

Marion County Baseline Landfill Preliminary Geotechnical and Geological Investigation – Future Cells IV-A and IV-B, JEA Project No: 13150-018-01, Ecological Completion Report. Jones Edmunds & Associates. June 2000. 17 pages.

Figure 2 – Baseline Conceptual Maximum Buildout – Marion County Baseline Landfill. Jones Edmunds & Associates. October 27, 2021. 1 page.

Marion County Board of County Commissioners, Procurement Services Department, RFQ23Q: Baseline Landfill Site Master Planning & Landfill Capacity Expansion Scope of Work. Due Date: March 23, 2023. 28 pages.

SITE GEOLOGY

The Baseline Landfill is atop karst topography, specifically Ocala Limestone with a thin overburden of younger sediments of sand and clayey materials. The upper limestone surface is variable with infilled pockets of clay and sand and potentially air- or water-filled cavities.

According to the US Geological Survey (USGS), the Eocene-age (approximately 35 million years ago) Ocala Limestone consists of nearly pure limestones and occasional dolostones. It can be subdivided into lower and upper facies based on lithology. The lower member is composed of a white to cream-colored, fine to medium grained, poorly to moderately indurated, very fossiliferous limestone (grainstone and packstone). The lower facies may not be present throughout the areal extent of the Ocala Limestone and may be partially to completely dolomitized in some regions. The upper facies is a white, poorly to well indurated, poorly sorted, very fossiliferous limestone (grainstone, packstone, and wackestone). Silicified limestone (chert) is common in the upper facies. Fossils present in the Ocala Limestone include abundant large and small foraminifers, echinoids, bryozoans, and mollusks. In the areas where the formation is at or near the surface, the Ocala Limestone exhibits extensive karstification. Problems regarding the development of sinkholes are related to the size and nearness to the surface of the limestone and these underground cavities. The upper surface of the Ocala Limestone may be highly irregular.

SUBSURFACE KARST TESTING

Although test borings are valuable in determining a site's overall characteristics, detailed subsurface analysis requires extrapolation and interpolation from point data, and depending on the heterogeneity of a site, borings invariably can miss features such as limestone cavities. Improvements in geophysical testing methodology provide a non-invasive, cost-effective approach to identify characteristics such as depths to limestone. For example, using electrical resistivity imaging (ERI) depths of over 100 feet are achievable via variable length linear transects. Ground penetrating radar (GPR) is best used for near-surface limestone detection as well as the material's matrix (e.g., voids). When combined, ERI and GPR are the preferred assessment methods to characterize the general subsurface conditions regardless of project size. Based on these data, areas of interest or anomalies are then further investigated with ground truthing geotechnical testing such as standard penetration test (SPT) borings or electric cone penetration test (ECPT) soundings.

Geophysical Surveys

Ground Penetrating Radar

GPR is a geophysical procedure used to detect and identify subsurface features and conditions characterized by a contrast in the material's dielectric properties. The technique involves the transmission from a receiver-transmitter antenna that is pulled/pushed along the ground surface

transmitting and receiving microwave energy into the ground. Subsurface contrasts in the dielectric properties of varying materials present a surface from which reflections are generated. Contacts between rock types, physical features such as cavities or disrupted sedimentary layers, and/or manmade objects such as metal barrels or pipes cause reflections that are recorded at the surface.

The intensity of the reflected signal is affected by the contrast in dielectric properties of materials, the electromagnetic conductivity of the medium through which the waves traverse, and the frequency of the signal. Digital signals are recorded and stored in a recorder for on-site visual color display or subsequent transferal to a computer for analysis and printing. The radar survey is conducted in general accordance with ASTM D6432, *Standard Guide for Using the Surface Ground Penetrating Radar Method for Subsurface Investigation*.

Penetration depths for GPR signals are a function of lithology type (greater signal attenuation in clayey materials or water-saturated conditions) and frequency (greater signal attenuation in higher frequency antenna systems). Actual depths of penetration vary from site to site.

Electrical Resistivity

The ER survey utilizes an electrical induced current into the ground and differences in conductivity provides Geologists to identify possible subsurface anomalies, which may be related to karst or sinkhole activity. In addition, the non-destructive procedure aids in locating SPT borings/CPT soundings. Historically, an ER survey utilized a collection of electrical resistivity soundings, combined to create a 1-D profile. During the previous Baseline electrical resistivity testing completed in the 1980's and 1990's, 1-D and 2-D profiles were produced from measurements taken from limited numbers of a particular electrodes' spacing using Lee-Directional methodology along a traverse or particular the survey line. Current technologies allow for multiple channel usage to simultaneously record data and with computer analyzed and created 2-D profiles. The technology allows for point data collection for a single traverse to increase from 6 points to thousands. The latest electrical resistivity imaging (ERI) surveys are conducted in general accordance with ASTM D6431, Standard Guide for Using Direct Current Resistivity Method for Subsurface Investigation, as applied to a multi-electrode resistivity system.

Geotechnical Testing Methods

Standard Penetration Test Borings

The SPT is a widely accepted method of testing subsurface materials. Borings are conducted in accordance with ASTM D1586, *Standard Test Method for Standard Penetration Test (SPT) and Split-Barrel Sampling of Soils*.

With SPT borings, a rotary drilling rig is used to advance the borehole to the desired test depth. A 2-foot-long, 2-inch-diameter split-barrel sampler attached to the end of a string of drilling rods is driven 18 inches into the ground by successive blows of a 140-pound hammer freely dropping

30 inches. The sum of blows required for penetrating the second and third 6-inch increments of penetration constitutes the “N” value.

Following an individual test, the sampler is extracted to allow visual classification and retention, if desired, of the core sample. Tests are typically performed at 5 feet deep intervals. N-values are generally correlated with material properties of stability to allow a conservative estimate of the behavior of subsurface materials.

Cone Penetration Test Soundings

Cone penetration tests (CPT) are used to extrapolate geotechnical subsurface properties, typically within the upper 100 to 200 feet (30 to 60 meters). The original mechanical *Dutch Cone* provided soil strength data every 6 inches. However, it has been replaced by an electronic, strain-gaged version. The cone consists of a conical tip and cylindrical *sleeve*. The *tip resistance* is determined by the force required to penetrate the soil, and the *sleeve friction* is determined by the shear stress developed along its surface. The commercially available CPT rigs operate primarily friction and piezocone penetrometers, whose testing procedures are provided in ASTM D5778, *Standard Test Method for Electronic Friction Cone and Piezocone Penetration Testing of Soils*. These devices produce a computerized log of tip and sleeve resistance. The ratio between the two, induced pore pressure just behind the cone tip, pore pressure ratio (change in pore pressure divided by measured pressure), and lithologic interpretation of each 2-centimeter (cm) interval are continuously logged. Soil type, shear strength, moduli, density, etc., can be inferred from these measurements.

1989 TO 1990 GEOLOGICAL REVIEW

GEOPHYSICAL TESTING

Electrical Resistivity

1989 – Electrical resistivity surveys were completed in Cell III. A total of 18,270 linear feet were surveyed with 1,566 separate measurements. A maximum depth of 70 feet was penetrated during these surveys. Testing equipment used a single channel system. Three rows of stations were spaced 150 feet apart from each other, creating 87 total profiles. Traverses were spaced 50 feet apart.

1990 – A subsequent Pole-Dipole survey was conducted. Six traverses were able to extend up to 100 feet below grade.

Ground Penetrating Radar

1989 – Electrical resistivity surveys were completed in the surveyed area. A total of 18,270 linear feet were surveyed with 1,566 separate measurements.

The geophysical testing resulted in identifying anomalous zones with interpreted zones of cavities/raveling within the upper limestone surface. A differential depth of the upper limestone surface was noted throughout the area of investigation.

GEOTECHNICAL TESTING

Standard Penetration Test Borings

SPT borings encountered limestone at depths varying from near surface to more than 120 feet (D-1, D-9, and D-16). Generally, Cell IIIB had the most variation and Cell IIIC had the shallowest depth to the upper limestone surface.

Cone Penetration Test Soundings

Generally, the depths of CPT soundings terminated at competent limestone. The depths of CPT-1 through CPT-22 varied from 18.5 to 73.3 feet.

COMPACTION GROUTING REVIEW

MEANS AND METHODS

A compaction grouting program aims to stabilize the subsurface due to the presence of cavities that have or likely will affect the ground surface's load-bearing capacity and to minimize the potential for future ground subsidence due to raveling. This is achieved by a combination of compacting loose soils, sealing the soil/limestone interface, and/or infilling any voids or partially filled cavities. The estimated depths and grout quantities are based on data developed as part of the geophysical and geotechnical testing. However, the proposed locations, depths, and/or quantities may be changed at the discretion of the Engineer based on actual site conditions (e.g., soil conditions).

The grout mixture consists of cement, water, and aggregate (sand). Schmertmann & Crapps recommended a slump of 3 to 5 inches with a pumping rate of 3 cubic feet per minute (cfm).

The means and methods of compaction grouting have changed very little over the last 30 years. Experience with grouting crews is much improved.

Review of Cell III-A

The first cell consisted of 12 acres. Seven SPT borings and nine auger borings were performed and included limited laboratory testing.

The laboratory tests consisted of falling head permeability tests and one-dimensional consolidation tests performed on two Shelby tube samples.

Limestone was encountered between 46 and 77 feet MSL (feet above mean sea level).

No voids were observed during the drilling operations. However, two surface cavities were discovered at the finished cell bottom (floor) elevation. One was 8 feet deep and 17 to 20 feet in

diameter. The other was rectangular shaped, 6 to 7 feet deep, and 21 feet long by 8 to 10 feet wide.

The remediation plan for these two cavities and any others that may have developed during excavation and/or proof-rolling consisted of filling them with Class C concrete.

Where limestone was encountered at the cell floor surface, remediation consisted of undercutting the limestone pinnacles at least 18 inches below the cell floor and adding a layer of sandy clay between the limestone surface and lining system.

Review of Cell III-B

For remediation planning purposes, this 15-acre cell's investigation was divided into four phases. Phase I consisted of performing 14 SPT borings, six CPT soundings (mechanical cone), and two ER surveys. Phase II involved trenching. Phase III consisted of 36 additional CPT soundings and GPR profiling. Phase IV added 60 CPT soundings, seven SPT borings, and five flat dilatometer tests (DMT).

After several subsequent meetings including the added testing, the total investigation effort included 21 SPT borings to a maximum depth of 116 feet, 102 CPT soundings to a maximum depth of 112 feet, five DMT tests to a maximum depth of 59 feet, 38 water-level monitoring locations, one GPR profiling, two ER surveys, and soil trenching.

According to Schmertmann & Crapps, the comprehensive subsurface investigation showed very erratic depths and weathered limestone surfaces. However, no major cavities were detected.

Based on these data, Dr. Schmertmann proposed a grouting plan to augment the landfill's primary and secondary stability defenses, i.e., installing a two-layer geofabric and two-layered high-density polyethylene (HDPE) liners.

The proposed grout program consisted of 394 grout injection points in nine different areas, requiring an estimated 10,403 cubic yards (CY) of grout and 21,660 linear feet (LF) of injection pipe. The expected area of required grouting was 1.9 acres or 12.6 percent of the total 15-acre cell.

On completion, the final tallies were 414 injection points of which only 400 were grouted, requiring 11,748 CY of grout and 23,736 LF of pipe. The final grouted total area was 3.2 acres[1] of the 15 acres or 21.3 percent. Post-grouting quality assurance included 44 SPT borings (six informational and 38 *checking*).

Comparing the proposed to the final quantities:

1) Grout Points – 5.1 percent more injection points (414 points were drilled)

[1] Another document titled *Phase III-C Permit Application*, September 1993, stated that Cell III-B had a total grouted area of 2.95 acres.

2) Injection Pipe – 13.4 percent more (21,660 LF versus 24,562 LF)[2]
3) Grout – 13 percent more (10,403 CY versus 11,748 CY)
4) Grouted Area – 69 percent higher (12.6 percent versus 21.3 percent)

Jones Edmunds' *Cell III-B Grouting Completion Report* summarized the overall effort and results. Jones Edmunds stated that the project objectives were in good accord with the Plans, expectations, and Specifications of the various engineers involved. Geohazards agrees with those opinions. Subsurface remediation quantities are extremely difficult if not impossible to estimate with a high level of confidence due to the subsurface heterogeneity of karst geology.

Geohazards has found that if our final quantities (total injection of pipe and grout) are within 5 to 15 percent of our estimate and the Specifications were followed, we consider the remediation effort to be successful. Furthermore, on those atypical projects in which the percentage varies more than the aforementioned range, if the differences are on the conservative side (i.e., additional pipe and grout was required compared to the estimate), it signifies that the subsurface was more variable, required increases of material, and is not a cause for concern. As the Cell III-B documentation results demonstrate, the data show that they fall on the conservative side.

Review of Cell III-C

While operations continued at Cell III-B, expansion of the landfill was expected with the proposed Cell III-C. This cell (19 acres) would exploit and use much of investigative methodology, foundation analysis, and bottom-liner design used in Phase III-B. However, after numerous sinks formed following rains and water ponding, Dr. Schmertmann stated that the sinkhole potential conditions were more severe in Cell III-C. This opinion was revised based on a shortage of sinkhole detection in the SPT borings, a significant thickness of cohesive material above the limestone surface, and the general uniformity of the limestone surface across the cell.

Dr. Schmertmann proposed a three-phase approach. Phase I consisted of 50 SPT borings, GPR surveys, and 50 CPT soundings. In Phase II, he recommended an additional 21 SPT borings. Phase III was for the actual grouting. He estimated 1,260 injection points on a 20-foot center-to-center (c/c) spacing, requiring 13,270 CY and 27,780 LF of pipe at an average injection depth of 22 feet.

Dr. Schmertmann estimated a total of $990,000 ($893,000 + $97,000 for construction quality assurance/construction quality control [CQA/CQC] testing) in costs associated with the grouting plan and based on Cell III-B unit costs with a range of -25 to +50 percent of the estimate.

Twenty-two sinkholes opened during a rain event with depths ranging from 1 to 15 feet. Others followed in somewhat linear patterns. These lineaments trended north-northwest (NNW) to south-southeast (SSE) and east (E) to west (W).

[2] Since 414 points were drilled and would require payment to the Contractor, the total additional injection pipe *installed* was computed to be 14 points to 59 feet or an additional 826 LF for a total of 23,736 + 826 = 24,562 LF.

One observation regarding the relative elevation of the limestone in Cell III-C compared to Cell III-B was the shallower depths (23 to 65 feet National Geodetic Vertical Datum [NGVD] – average 33 feet – compared to an average 59 feet for Cell III-B.)

A soft mud layer below 60 feet MSL and evidence of sinkhole formation below 58 feet MSL caused concern.

The three phases previously mentioned were performed, resulting in 61 SPT (CB) borings. Note: CB refers to Cell C and B borings. Seventy-one (71) borings were cited including the previous CBF (additional borings performed in conjunction with the grouting. Also, due to the cover of clayey sand, limestone pinnacles, and soil debris, GPR surveying was deemed to be ineffective.

Grouting was Phase III of the plan developed by Dr. Schmertmann to defend against excessive differential settlement (maximum of 6 inches) and to reduce formation of future sinkholes. The plan consisted of a set of primary grout injections in a 20-foot c/c grid pattern. He recommended against standard *compaction grouting* and instead recommended a modification termed *cap-grouting*. A primary difference is that the former Specifications call for grout slumps of 2 to 3 inches; the latter uses 3 to 5 inches (average of 4 inches). Furthermore, the grout pipes were inserted without water jetting.

The *bottom-up* grouting procedure commenced 1 foot above the refusal depth. The pipe was then raised in 2-foot increments. The bottom 11 feet of the grout hole was injected unless grout was deposited within 5 feet below the top of the bottom-liner system.

Three criteria were used to determine cessation of grouting before the previously mentioned depths:

1) Injection pressure of 50 pounds per square inch (psi) + 2 x Z, where Z was the depth below ground surface to the pipe's nozzle.
2) Five CY of grout per 2-foot injection increment.
3) Ground heave of more than 0.25 inch per 2-foot injection increment or no more than 1.2 inches of total heave at the injection point.

Seven hundred and ninety points were grouted into the initial grout zone taking 6,189.87 CY of grout. Grout quantities ranged from 0.10 to 33.11 CY with an average take of 7.84 CY per point.

For the weak zone grouting (those locations that encountered loose or weak soil layers during pipe insertion), a standard 5-foot pulled increment of the injection pipe was used. This operation consisted of 455 injection points, taking 790.64 CY of grout. Grout quantities ranged from 0.0 to 62.18 CY, with an average take of 1.74 CY per point. In addition, the *stop grouting* criteria were 0.75 inch of ground heave or excess pump pressure cited for the primary points. No limits were on how much grout injection could be injected at a particular injection depth.

Grouting consisted of 822 injection points (the proposed number was 568); however, only 790 points were grouted. The 32 points that were not injected were due to the grout pipe penetration depth being less than the depth to the top of the subgrade layer. Generally, this occurred where it was extremely difficult to excavate the ground surface to the final bottom-

liner grade or the limestone was at or close to the surface. For these cases, the limestone was over excavated by 2 feet and backfilled with clay.

Eighty-nine of the grout points had grout with low (less than 200 psi) compressive strength samples. Thirty-four remedial points were subsequently added.

Dr. Schmertmann's original grouting plan called for injection points requiring an estimated 13,750 CY of grout and 27,780 LF of injection pipe. The expected area of required grouting was 5.25 acres plus a 51-percent expansion (observed in Cell III-B remediation) or a total of 7.9 acres, 41.6 percent of the total 19-acre cell. The average estimated depth of grouting was 22 feet (compared to the actual 59 feet for Cell III-B).

Post-grouting CQA/CQC testing consisted of 12 SPT borings, 17 CPT soundings, and two conical test loads.

Review Summary

Based on reviewing the documents provided by Jones Edmunds, Geohazards agrees with the overall planning, testing, and remediation efforts performed. This includes the quantities consumed and the post-remediation efforts made. Table 1 below provides summaries of the quantities expended for each of the three Cells (A, B, C).

Over 20 years have elapsed between completing the (latest) Cell III-C efforts and producing this report. The expectation is that over this period, any *failures* that occurred (including in Cell III-B) would be noted. We understand that none has been reported. Therefore, elapsed time is probably the best benchmark to use to assess whether the previous stabilization programs were successful.

Cell III Data Combined

Cell	III-A	III-B	III-C
Acres	12	15	19
SPTs	7	44	61
Auger Borings	9	–	–
CPTs (pre-grouting)	–	102	17
GPR	–	Yes	12
ER	–	Yes	Yes
Compaction Grout (CY)	–	11,748	6,980
Injection Points	–	414	822[3]
LF of Pipe	–	23,736	21,372
Post-Grout CPTs	–		12

[3] 790 points were grouted.

Post-Grout SPTs	–	43	17

Table 1: Combined Data from Review of Cell III

GENERAL COMMENTS

Cell III-B

Once the borings, cone soundings, ER, GPR, and other information were generated, Dr. Schmertmann stated that sinkhole subsidence was possible compared to Cell III-A. Accordingly, he designed an additional containment liner layer (together with the double HDPE liner system) composed of geofabric to span the detected voids encountered in the investigation. This geomembrane would serve as a tension membrane and filter to prevent sinkhole raveling. In his opinion, other solutions such as grouting, dynamic compaction, removal and replacement of engineered soil, etc., were more costly and less certain.

He designed the protection using a plates and shells theory together with his own research of sinkholes, soil arching, and cavity collapse to compute the tensile loads on a deflected membrane spanning a 15-foot-diameter circular void or a 10-foot-wide slot void.

His parametric demonstrated that geotextile fabrics from manufacturers Nicolon, Exxon, and GTF (George L. Wilson) would support and stabilize the cavity dimensions.

Cell III-C

Planning for this cell was based primarily on Cell III-B investigative and remedial operations. The bottom-liner system was essentially identical to Cell III-B. After approximately 15 inches of rain fell in 2 days, multiple sinkholes (2232 developed over time) between 1 to 15 feet deep and 3 to 12 feet in diameter occurred. Other sinkholes formed from another rain event. These and others were backfilled to grade. However, Dr. Schmertmann required that these be excavated, compacted, and checked with a hand penetrometer.

To remediate the subsurface, Dr. Schmertmann relied on the SPT, CPT, and DMT results to determine the layout of grout points for the site. After remediation, verification tests were distributed over the entire grouted area. The CPT and SPT tests showed acceptable bearing capacity and N- values. Two conical load tests (CTL) were constructed to estimate the long-term settlement when the landfill reached its ultimate capacity. The specifics of this test were provided in Dr. Schmertmann's ASCE Technical Note, Vol. 119, No. 5, May 1993 "Conical Test Load Measuring Compressibility". Settlement plates to installed to measure the maximum and differential subgrade settlements. These cone shaped soil mounds were constructed in four lifts ultimately reaching a height of 15 feet and base diameter of 44 feet. The soil produced a maximum vertical loading of 420 tons. The results showed settlements of 0.07 and 0.03 feet respectively under the center of the CTLs. These data clearly met the maximum differential settlement requirement of 0.5 foot. Detailed logs of the CPT, SPTs and CTLs are detailed in Appendix D of the "Marion County Baseline Landfill Phase III-C Expansion, Modified Compaction Grouting Program" Volume I of II, Jones, Edmunds & Associates, Inc., July 1995.

For reference, the adopted final design included the following from top down:

1) 12-inch-thick sand protection layer.
2) 12-inch-thick sand drainage layer.
3) 60-mil HDPE geomembrane.
4) 250-mil HDPE geonet.
5) 60-mil HDPE geomembrane.
6) 12-inch-thick clay barrier layer.
7) 12-inch-thick compacted earthfill layer.
8) Type I subgrade stabilization geofabric (two layers).
9) Existing subgrade (proof-rolled and compacted).
10) Modified compaction grout subgrade.

The bearing capacity of the soils overlying the limestone indicated a factor of safety of 2.2, which is conservative because it assumes that the loading is applied instantaneously, and settlement occurs concurrently. Over time, as minor settlement occurs during loading, soil strengths also improve incrementally.

Bearing capacity was determined using the ASTM STP 1070, article *Evaluation of the Stability of Sanitary Landfills*, Sukhmander and Murphy, 1990, pages 240 to 258 procedure. The procedure is based on SPT average N values at 0.75B below the liner. However, this depth is well into limestone; therefore, Dr. Schmertmann used an average N value of 10 for the sediments on top of the limestone.

For settlement analysis, Dr. Schmertmann used the DMT results from Cell III-B to compute a compression modulus, and using this factor resulted in a maximum settlement of 3.3 inches.

The history of the Baseline Landfill shows that the engineering of it has proven successful. This is clearly evidenced by over 26 years elapsing since the closure of Cells III-B and III-C. No alterations to the strategies used to date are needed. The subsurface of future cells would use SPT and ECPT results to select pre-grout locations and confirm successful remediation.

Geohazards agrees with the previously implemented investigation strategies, subsurface remediation techniques, post-grout stabilization assurance testing, and liner system.

PROJECTED COSTS

Due to the successful implementation of the remedial strategies employed in the previous phases of the Baseline Landfill, Geohazards proposes using similar estimations for testing and remediation quantities. An average for Cells III-B and III-C were used to calculate the geophysical and geotechnical testing costs. Current market prices were used for these calculations.

Cell	III-B	III-C	Per Acre
Acres	15	19	1
SPTs	44	61	3.29
Auger Borings			
CPTs	102	17	3
GPR	Yes	Yes	Yes
ER	Yes	Yes	Yes
Compaction Grout Yard^3	11,748	6,980	550
Injection Points	414	822	36
LF of Pipe	23,736	21,372	1,327
Post Grout CPT		17	0.5
Post Grout SPTs	43	12	1.62
Total per Acre Cost is approximately $217,331.00			

Chart 2: Per Acre Average and Cost Estimate

Chart 2 shows that a per-acre estimate is $217,331.00 for the geophysical/geotechnical testing and karst remediation of land in the Baseline Landfill area. Recent volatility of grout costs has raised prices up to 15 percent from 2 years ago. These prices are estimates, and actual conditions may raise or lower prices significantly.

CERTIFICATION

This report was prepared under the direction and supervision of a Professional Geologist and a Professional Engineer, licensed by the State of Florida, whose experience and field of expertise includes identification of sinkhole activity and the remedial measures for stabilization. The signatures and seals of the geologist and engineer with Florida License Numbers appear on the report.

David Bloomquist PhD, PE
Professional Engineer
Florida License No. PE37235

This item has been digitally signed and sealed by Dr. David Bloomquist, PhD, PE, on April 18, 2024.

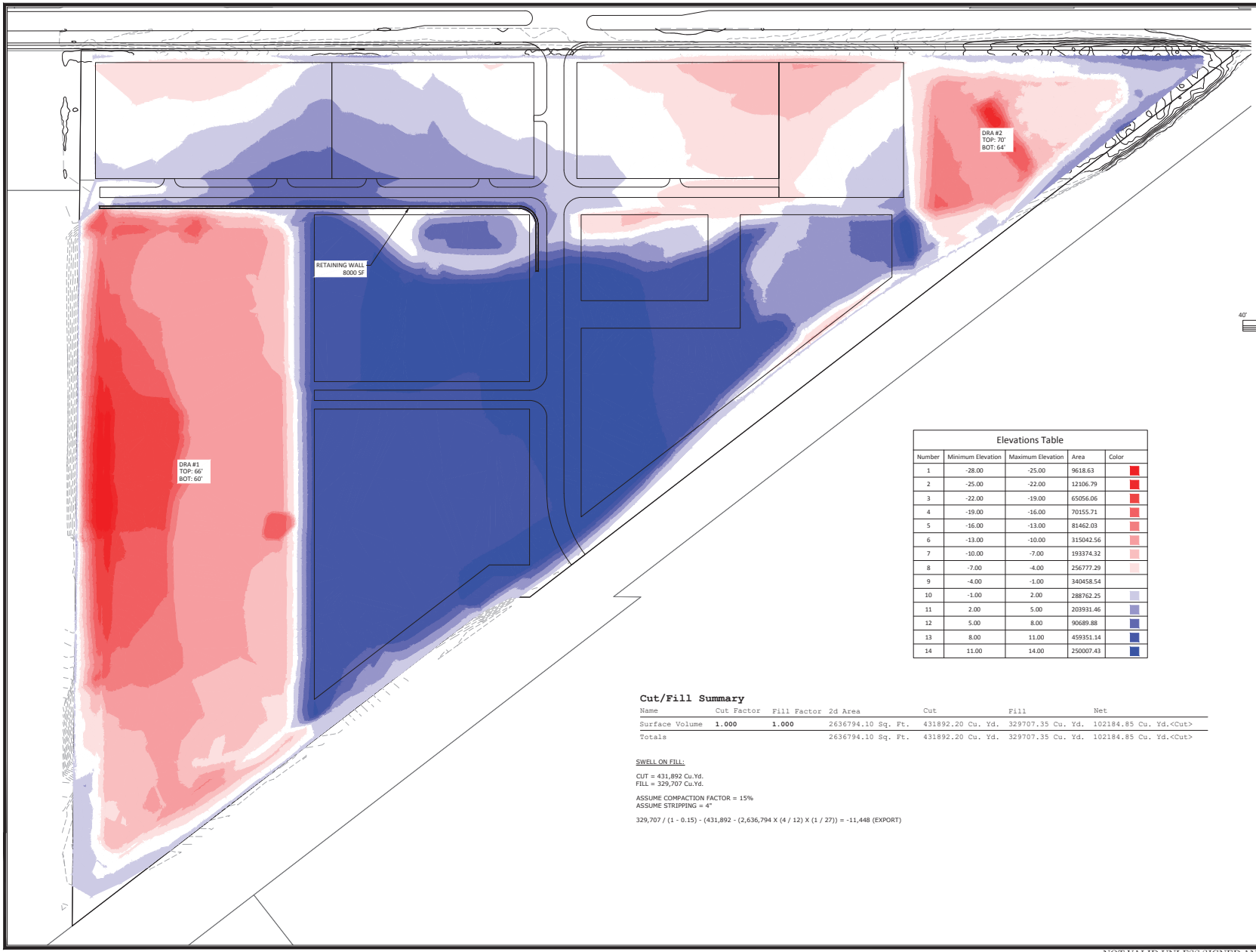
James Olson, PG
Professional Geologist
Florida License No. PG2795

This item has been digitally signed and sealed by James Olson, PG, on April 18, 2024.

Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Appendix D

East Parcel Development Drawings and Cost Estimate



40' 20' 0 40' 80'
SCALE IN FEET
1" = 40'

Elevations Table				
Number	Minimum Elevation	Maximum Elevation	Area	Color
1	-28.00	-25.00	9618.63	
2	-25.00	-22.00	12106.79	
3	-22.00	-19.00	65056.06	
4	-19.00	-16.00	70155.71	
5	-16.00	-13.00	81462.03	
6	-13.00	-10.00	315042.56	
7	-10.00	-7.00	19337.32	
8	-7.00	-4.00	256777.29	
9	-4.00	-1.00	340458.54	
10	-1.00	2.00	288762.25	
11	2.00	5.00	203931.46	
12	5.00	8.00	90689.88	
13	8.00	11.00	459351.14	
14	11.00	14.00	250007.43	

Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Surface Volume	1.000	1.000	2636794.10 Sq. Ft.	431892.20 Cu. Yd.	329707.35 Cu. Yd.	102184.85 Cu. Yd.<Cut>
Totals			2636794.10 Sq. Ft.	431892.20 Cu. Yd.	329707.35 Cu. Yd.	102184.85 Cu. Yd.<Cut>

SWELL ON FILL:

CUT = 431,892 Cu.Yd.
FILL = 329,707 Cu.Yd.

ASSUME COMPACTION FACTOR = 15%
ASSUME STRIPPING = 4"

329,707 / (1 - 0.15) - (431,892 - (2,636,794 X (4 / 12) X (1 / 27)) = -11,448 (EXPORT)

Tillman & Associates
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1720 SE 16th Ave. Bldg 100, Ocala, FL 34471
Office: (352) 387-4540 Fax: (352) 387-4545

REVISIONS

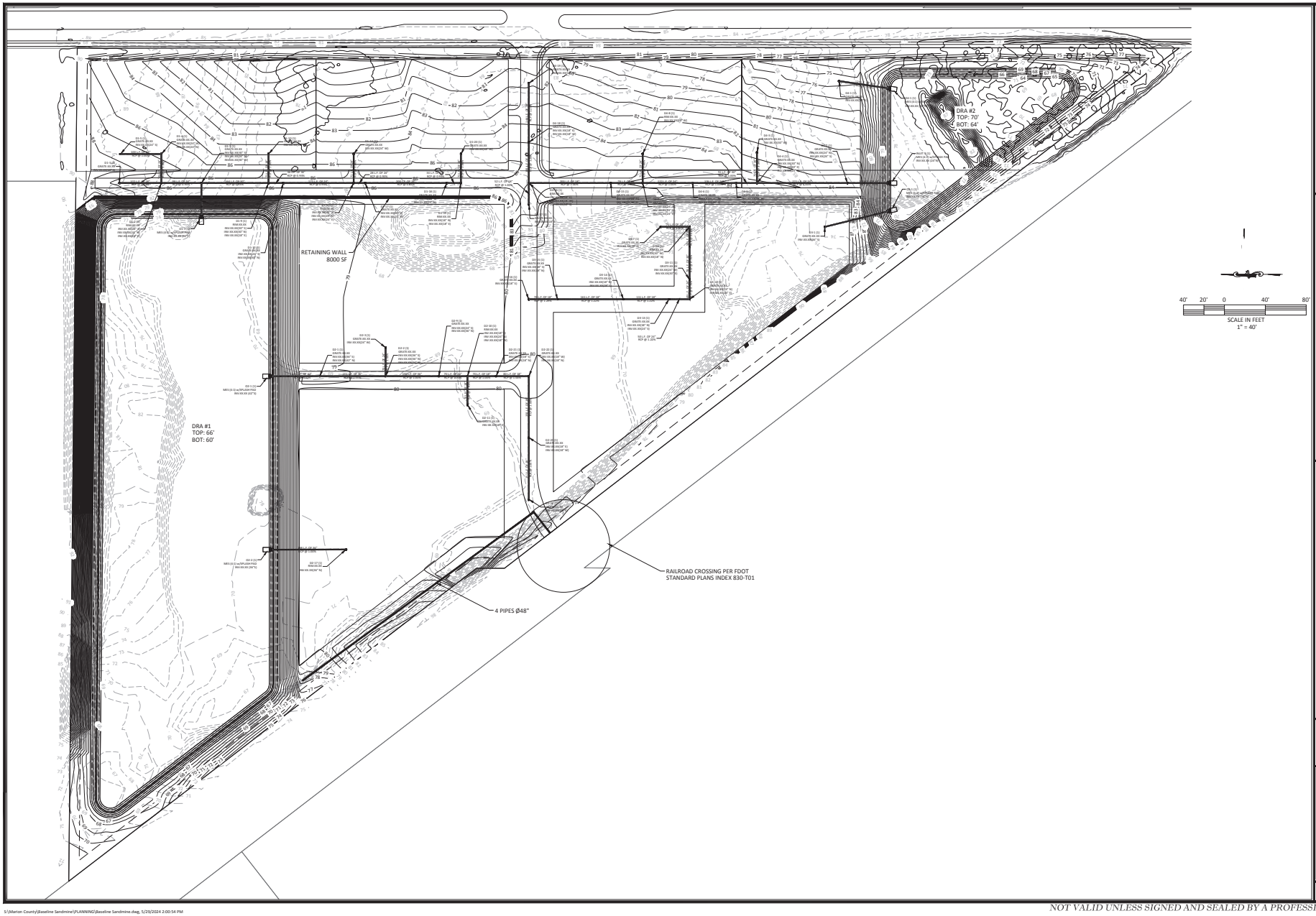
DATE:

BASELINE SANDMINE
MARION COUNTY, FLORIDA

EARTHWORK EXHIBIT

DATE 5/29/24
DRAWN BY AK
CHKD. BY PM
JOB NO. 24-9002

SHT 01



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Office: (352) 387-4540 Fax: (352) 387-4545

REVISIONS

DATE

BASELINE SANDMINE
MARION COUNTY, FLORIDA

GRADING & DRAINAGE PLAN

DATE 5/29/24
DRAWN BY AK
CHKD. BY PM
JOB NO. 24-9002

SHT. 02

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NOT VALID UNLESS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

Tillman & Associates
ENGINEERING, LLC.
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REVISIONS

DATE

BASELINE SANDMINE
MARION COUNTY, FLORIDA

MASTER UTILITY PLAN

DATE 5/29/24
DRAWN BY AK
CHKD. BY PM
JOB NO. 24-9002

SHT. 03

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PROJECT	**BASELINE EXPANSION - PRELIMINARY COST ESTIMATE**								
ADDRESS	**MARION COUNTY, FLORIDA**								
Submission									
Date of plans									
Total Cost Estimate	**$ 9,092,827**								
Lot Count & Per lot Cost									
Acreage & Per Ac Cost	**64.00**	**$142,075**							
LF of Roadway & Per LF Co	**3,409**	**$2,667**							

Tillman & Associates ENGINEERING, LLC.

Website: www.tillmaneng.com
Email: permits@tillmaneng.com
Contact: (352) 387-4540

SR #	DWG. NO.	DETAIL NO.	DESCRIPTION	QTY.	UNIT	TOTAL UNIT COST	TOTAL COST	SUBTOTALS
			GENERAL CONSTRUCTION					
1			GENERAL CONDITIONS	1	EA	$ 9,500.00	$ 9,500	
2			MOBILIZATION	1	LS	$ 10,000.00	$ 10,000	
3			EROSION CONTROL - INLET PROTECTION	83	EA	$ 120.00	$ 9,960	
4			SURVEYING - CONSTRUCTION LAYOUT	1	LS	$ 72,000.00	$ 72,000	
5			DEMO AS NEEDED	1	EA	$ 10,000.00	$ 10,000	
6			SURVEYING - AS-BUILTS	1	LS	$ 30,000.00	$ 30,000	
							Sub Total	**$ 141,460**
			SEWER					
7			6" PVC Pipe SDR 26 (6' -8')	2,840	LF	$ 31.00	$ 88,040	
8			6" PVC Pipe SDR 26 (8' -10')	475	LF	$ 32.00	$ 15,200	
9			6" x 6" x 6" PVC WYE	4	EA	$ 160.00	$ 640	
10			4' DIA. SANITARY MANHOLE (6'-8')	14	EA	$ 3,675.00	$ 51,450	
11			4' DIA. SANITARY MANHOLE (8'-10')	3	EA	$ 4,050.00	$ 12,150	
12			4'' PVC C-900 DR18 FORCE MAIN	2,895	LF	$ 17.50	$ 50,663	
13			6'' PVC C-900 DR18 FORCE MAIN	1,335	LF	$ 25.00	$ 33,375	
14			4" PVC 45° BEND	2	EA	$ 360.00	$ 720	
15			6" PVC 45° BEND	18	EA	$ 55.00	$ 990	
16			AIR RELEASE VALVE ASSEMBLY - TYPE A	3	EA	$ 5,450.00	$ 16,350	
17			4" MEGA LUG FITTING RESTRAINT	42	EA	$ 80.00	$ 3,360	
18			6" MEGA LUG FITTING RESTRAINT	19	EA	$ 100.00	$ 1,900	
19			4' DIA. SANITARY MANHOLE	10	EA	$ 8,225.00	$ 82,250	
20			LIFT STATION W/ GENERATOR, FENCING AND STONE	1	LS	$ 519,900.00	$ 519,900	
21			SANITARY TESTING	1	LS	$ 4,310.00	$ 4,310	
							Sub Total	**$ 881,298**
			STORM					
22			TYPE 'V' INLET	73	EA	$ 5,475.00	$ 399,675	
23			STORM MANHOLE	11	EA	$ 3,750.00	$ 41,250	
24			18'' RCP STORM PIPE	125	LF	$ 49.00	$ 6,125	
25			24'' RCP STORM PIPE	1,810	LF	$ 67.00	$ 121,270	
26			30'' RCP STORM PIPE	1,809	LF	$ 99.00	$ 179,091	
27			36'' RCP STORM PIPE	639	LF	$ 106.00	$ 67,734	
28			42'' RCP STORM PIPE	130	LF	$ 134.00	$ 17,420	
29			48'' RCP STORM PIPE	586	LF	$ 205.00	$ 120,130	
30			30'' MES W/ SPLASH PAD	2	EA	$ 2,600.00	$ 5,200	
31			36'' MES W/ SPLASH PAD	2	EA	$ 3,400.00	$ 6,800	
32			48'' MES W/ SPLASH PAD	1	EA	$ 5,300.00	$ 5,300	
33			STORM TESTING	1	LS	$ 15,500.00	$ 15,500	
							Sub Total	**$ 985,495**
			WATER					
34			12" PVC WATER MAIN (AVG. DEPTH= 4') ALONG BASELINE	2,500	LF	$ 120.00	$ 300,000	
35			12" PVC WATER MAIN (AVG. DEPTH= 4') ONSITE	1,115	LF	$ 72.00	$ 80,280	
36			8" PVC WATER MAIN (AVG. DEPTH= 4')	1,115	LF	$ 36.00	$ 40,140	
37			12'' 45 DEGREE BEND	8	EA	$510.00	$4,080	
38			12" TEE	4	EA	$1,450.00	$5,800	
39			12'' GATE VALVE & BOX	4	EA	$2,780.00	$11,120	
40			8'' 45 DEGREE BEND	8	EA	$ 275.00	$ 2,200	
41			8'' GATE VALVE & BOX	3	EA	$ 1,690.00	$ 5,070	
42			8" x 45° M.J.D.I. BEND EPOXY	8	EA	$ 1,055.00	$ 8,440	
43			CONNECTION NEW 8" MAIN TO EXISTING 8" MAIN	1	EA	$ 1,550.00	$ 1,550	
44			12" DIRECTIONAL BORE ACROSS BASELINE	240	LF	$ 120.00	$ 28,800	
45			8" X 8" TEE	5	EA	$ 405.00	$ 2,025	
46			FH ASSEMBLY	5	EA	$ 4,480.00	$ 22,400	
47			BLOW OFF ASSEMBLY	6	EA	$ 980.00	$ 5,880	

PROJECT	**BASELINE EXPANSION - PRELIMINARY COST ESTIMATE**								
ADDRESS	**MARION COUNTY, FLORIDA**								
Submission									
Date of plans									
Total Cost Estimate	**$ 9,092,827**								
Lot Count & Per lot Cost									
Acreage & Per Ac Cost	**64.00**	**$142,075**							
LF of Roadway & Per LF Co	**3,409**	**$2,667**							

Tillman & Associates ENGINEERING, LLC.

Website: www.tillmaneng.com
Email: permits@tillmaneng.com
Contact: (352) 387-4540

SR #	DWG. NO.	DETAIL NO.	DESCRIPTION	QTY.	UNIT	TOTAL UNIT COST	TOTAL COST	SUBTOTALS
48			BACTERIOLOGICAL & DISINFECTION	1	LS	$ 5,250.00	$ 5,250	
49			HYDROSTATIC PRESSURE TESTING	1	LS	$ 5,250.00	$ 5,250	
							Sub Total	**$ 528,285**
			EARTHWORK/EROSION CONTROL/CLEARING					
50			DUST CONTROL	1	LS	$ 55,000.00	$ 55,000	
51			CLEARING AND GRUBBING	64	AC	$ 1,200.00	$ 76,800	
52			CUT	431,892	CY	$ 5.00	$ 2,159,460	
53			FILL	329,707	CY	$ 5.00	$ 1,648,535	
54			SEED DISTURBED AREAS	205224	SY	$0.42	$86,194	
55			SOD - BACKSLOPES & SWALES	91055	SY	$3.75	$341,456	
56			SOD - 2' BACK OF EOP	1926	SY	$3.75	$7,222	
57			GEOTECHNICAL TESTING	1	LS	$ 29,500.00	$ 29,500	
							Sub Total	**$ 4,404,167**
			SITEWORK/PAVING & MISC.					
58			LIMEROCK, STD, 8"	13,481	SY	$ 14.90	$ 200,864	
59			PRIMECOAT	11,555	SY	$ 0.66	$ 7,626	
60			ASPHALT, 2"	11,555	SY	$ 20.00	$ 231,100	
61			SIGNAGE & STRIPING	144	LF	$ 3.35	$ 10,000	
62			SIDEWALK	15,000	SF	$ 5.34	$ 80,100	
63			DROP CURB AND GUTTER	6,818	LF	$ 38.40	$ 261,811	
64			RETAINING WALLS	12,000	SF	$ 32.00	$ 384,000	
65			RAILROAD CROSSING	1	EA	$ 150,000.00	$ 150,000	
							Sub Total	**$ 1,325,502**
TOTAL							***$ 8,266,207***	
CONTINGENCY						***10.00%***	***$ 826,621***	
TOTAL COST ESTIMATE							***$ 9,092,827***	

Notes:

1) Unless specific above, cost estimate excludes: Permits, Testing, Rock Removal, Remove and Replace Unsuitable, Traffic Control, Fencing, Electrical Conduit, Telephone, Cable, Irrigation, and Landscaping.

Appendix E

East Parcel Evaluation Technical Memorandum

TECHNICAL MEMORANDUM

Marion County Baseline Landfill

TO: Mark Johnson, Director Solid Waste
Marion County Board of County Commissioners

FROM: Mark Hadlock, PE

DATE: March 8, 2023

SUBJECT: East Parcel Evaluation
Jones Edmunds Project No. 13150-281-01

1 INTRODUCTION

Marion County is considering purchasing two parcels of land to the east of Baseline Landfill to relocate low-impact activities and provide improved facilities and services to the public. Figure 1 shows the locations of the East and Frontage Parcels and the current conditions of the property as of October 2021. The first parcel, referred to herein as the East Parcel, is 48 acres that until recently were used as a sand mine. Approximately 26 of the 48 acres have been fully or partially excavated, with the total excavated volume estimated at 1,000,000 cubic yards (cy) (26 acres x 25 feet average depth). The excavated portion of the East Parcel may be suitable to use as a drainage retention area (DRA) with space remaining for other waste management activities on the remaining unexcavated areas; however, partial reclamation of the excavated area will be needed.

The second parcel, herein referred to as the Frontage Parcel, totals 16 acres and fronts Baseline Road/County Road (CR) 35. The Frontage Parcel has not been excavated and does not need restoration. The Frontage Parcel provides space for administrative/office facilities and similar activities with space reserved for future public or private development. The Frontage Parcel does not impact the use of the East Parcel by the County and is neutral to this evaluation, except to provide space for relocated and new facilities.

2 AVAILABLE SPACE FOR DEVELOPMENT

The East Parcel has been used as a soil borrow pit for the last several years. A large portion of the 48-acre site, approximately 26 acres or 54 percent, has been excavated to an estimated 25 to 35 feet below existing grade as shown on Figure 1.

Based on visual observation and publicly available aerial photography, a portion of the excavated area could be used as a large DRA. This would provide space to relocate or partially relocate the existing West DRA on the landfill property. The West DRA is the largest on the existing Landfill property and receives the majority of stormwater. In addition, the West DRA has been enlarged over the years as additional soil was borrowed for landfill operations and is larger than needed for just the DRA. The West DRA volume is estimated at

210,000 cy (10 feet x 13 acres). The West DRA size/footprint was used as a template for relocation to the East Parcel, referred to as the North DRA on the East Parcel as shown in Figure 2.

The large excavation on the East Parcel is approximately five times larger (26 acres x 25 average depth = 1,000,000 cy) than the existing West DRA, resulting in the need to partially refill the East Parcel excavation to make more space available for facilities relocation. The actual amount of remediation required on the East Parcel will depend on the actual development of the site.

Based on visual observation and publicly available aerial photography, space allocations for the East Parcel are generally estimated as follows:

- East parcel = 48 acres
- Less North DRA (48 – 13 = 35 acres).
- Remaining for development = 35 acres.

Additional stormwater capacity on the East Parcel may be needed to accommodate stormwater from the development of the East Parcel and facilitate stormwater conveyance and runoff from the Frontage Parcel. The space allocated for facilities shown on Figure 2 includes space for smaller, localized DRAs in addition to the North DRA.

3 SITE RESTORATION

Because of the large excavation on the East Parcel, roughly estimated at 1 million cy, a portion of the excavated area needs to be restored. Restoration in this case is focused on backfilling a portion of the excavation with suitable soils. The excavated area is approximately 26 acres, of which approximately 13 acres is set aside for the North DRA. The Frontage Parcel does not need restoration.

The East Parcel owner had a geotechnical investigation performed in 2019 including eight soil penetration test (SPT) borings to depths varying from 20 to 35 feet below grade. The geotechnical report shows natural limestone formations/pinnacles to within 9 to 20 feet of the original surface elevations. This is consistent with the geology seen in the construction of the lined cells at the Baseline Landfill. Subsurface stabilization, compaction grouting, or other type of foundation stabilization will likely be needed in some areas to help prevent future subsidence under or near structures.

The materials identified in the geotechnical report for the East Parcel as existing soil would be suitable to use as backfill for site restoration. Unsuitable soils include clay, muck, organic material, silty soil, and large-diameter rocks/limestones to within 15 feet of the surface elevation. Attachment 1 lists the properties of the suitable and unsuitable soils. In general, soil materials identified as A-1, A-2, and A-3 are suitable. Soil materials identified as A-4 and A-5 may be suitable in limited quantities and in thin lifts. Soil materials identified as A-6 and A-7 are unsuitable.

Restoration soils used within 10 vertical feet of the bottom of the DRA should be permeable and not silty or clayey to allow the water in the DRA to infiltrate. As part of this development option, the surface elevation of the bottom of the proposed large stormwater

DRA would be approximately 10 feet below the final surface grades/elevations and tie to surface grades with slopes not to exceed 4 feet horizontal to 1 foot vertical (4:1). The depth of stormwater DRAs is limited by County Development Code, Article 6, Division 13; however, an exemption/deviation for a deeper DRA maybe possible. If so, the amount of backfill needed for restoration will be reduced. For every 5 feet the bottom of the North DRA can be lowered, approximately 100,000 cy of backfill can be eliminated.

Setbacks from the property boundary based on County Development Code Article 4, Division 3, appears to be 25 feet; however, if a special use permit is needed, site-specific setbacks may be required. In this case, the setback may need to be wider than the minimum distance to accommodate a robust vegetative buffer and perimeter fence.

4 INCLUDED FACILITIES

Figure 2 shows the facilities included in this evaluation for possible relocation. The facilities currently located on the Baseline Landfill property included in the East Parcel layout are:

Offices/Buildings
- Administration building
- Operations building
- Equipment maintenance facility
- In-bound scalehouse and scales

Citizen Services
- Hazardous waste collection center
- Baseline citizen recycling center
- White goods storage
- Waste tires storage

Environmental Compliance Systems
- Leachate storage
- Leachate pre-treatment
- Landfill gas flare station
- Landfill gas to energy plant
- In-bound scalehouse and scales
- North DRA
- South DRA

Space for new/additional facilities on the East and Frontage Parcel include
- Space reserved for future use
- Access roads/railroad crossings
- Vegetative buffer

The colored blocks shown on Figure 2 represent the space allocated to each facility listed above. The colored blocks are slightly oversized compared to the existing facilities at the Baseline Landfill. As a result, space will likely be available for additional facilities not included above.

5 STORMWATER

The County would like to divert stormwater from the West DRA on the Baseline Landfill property to the East Parcel to make space available on the landfill site to consolidate operations. The West DRA is the largest DRA on the Baseline Landfill property and currently receives most of the stormwater from the Baseline site. The West DRA is approximately 13 acres. The West DRA has been expanded several times to use as a sand borrow source and is larger than is required for just a DRA.

The stormwater will flow from the West DRA to the East Parcel using the slope from the elevated areas of the landfill to drain to the east. A stormwater culvert pipe crossing is needed to cross the existing railroad tracks/right-of-way (ROW). Stormwater currently flows into the West DRA by seven 36-inch-diameter reinforced-concrete pipe (RCP) culverts. The railroad crossing will require an equivalent amount of flow capacity at a minimum. Inspection of the East Parcel indicated that sufficient slope/fall should be available to flow stormwater from the Baseline Landfill to the East Parcel; however, detailed topography of the railroad bed and the excavated areas on the East Parcel was not available and will need to be confirmed.

The West DRA volume is estimated at 210,000 cy (10 feet x 13 acres). The full size of the West DRA was used as a template for sizing the DRA on the East Parcel, which will take up approximately half of the 26-acre excavated area to provide corresponding stormwater storage. Development of the East and Frontage Parcel will require a stormwater management system in addition to the relocated West DRA.

The current layout of the East Parcel includes the relocated West DRA of 13 acres and a second major DRA in the south triangular conner of the parcel of approximately 6 acres. The DRA size can be increased or decreased, based on the actual development plan selected. Within the limits of the remaining space available for development (East Parcel only) of 29 acres (48 – 13 – 6 = 29 acres), space is available for several additional smaller/linear DRAs to convey stormwater to the large DRAs and provide additional storage and treatment capacity if needed.

5.1 NW DRA

Since the time this project was developed, the County has stated that the area northwest of the Baseline site could be used for a new DRA as needed, in addition to the East Parcel, referred to herein as the NW DRA. The area available for a new NW DRA of 18+ acres in the northwest corner exceeds the current size of the West DRA by approximately 35 percent, totaling 290,000 cy of storage capacity (18 acres x 10 feet). This decision by the County simplifies the question of the suitability of the East Parcel to accept most of the stormwater from the Baseline site.

The size of new NW DRA can be increased or decreased based on the actual development at the Baseline Landfill and the East Parcel. As a result of this decision, questions about sufficient stormwater retention on the Baseline site and the East Parcel are largely eliminated, except for detailed design and conveyance considerations; however, construction of the NW DRA has its own complications.

Attachment 2 contains the Jones Edmunds 2008 Satellite Dump Investigation Report Update.

5.2 OLD DUMP SITE

A portion of the northwest Baseline property is an old unregulated/unlined dump site of approximately 15 acres that dates from the 1950s. The area was investigated in 2007–2008 and is referred to as the McKay Dump. This was part of a larger effort to catalogue old dump sites across the County and evaluate possible threats to the local community. Attachment 3 includes the portion of the geotechnical report addressing the McKay Dump.

To use the McKay Dump site for the NW DRA, the existing waste will need to be excavated. The different material types excavated can be sorted for different reuse options. The excavated waste material types will generally fall into the following categories:

- Waste requiring landfilling.
- Recyclable materials like concrete, asphalt, and metals.
- Recovered soils suitable for reuse within the limits of the lined landfill cells.
- Recovered soil suitable for unrestricted use.
- Old tires.
- Possible hazardous materials including asbestos-containing materials.

The old dump site is believed to be a trench fill where linear trenches were excavated in parallel, with a wall of unexcavated clean soil between the trenches. If future investigations confirm that the old dump was a trench fill, a large amount of clean soil could be recovered. From previous landfill excavation/mining projects we have performed, the quantity of clean/ unrestricted-use soil could be as much as 30 percent of the total excavation or 72,000 cy. In addition, recovered soils that are suitable for reuse within the landfill could also total 30% or 72,0000 cy that can be used as daily cover in landfill operations. The value of the soil to the County could partially offset the cost of waste excavation.

Another advantage of using the northwest area for the major DRA on the Baseline site is that it only needs to be constructed as the West DRA is removed from service, potentially over several years. This provides the time needed to investigate the old dump and perform excavation/mining. Based on the eventual size of the NW DRA, it could be used to decrease the size of the DRAs on the East Parcel and provide more space for development.

6 RAILROAD

One major concern about using the East Parcel was the need to access it directly from the Baseline Landfill site. A little-used railroad siding separates the two pieces of property. Being able to cross the railroad internally versus using SE 66th Street and Baseline Road/ CR 35 would save the County considerable time and expense over the remaining years of operations, eliminate traffic on public roads, and improve safety. Accessing the East Parcel from the Baseline site will require an at-grade railroad crossing, stormwater culvert crossing, and additional pipe crossings for landfill gas and leachate. When this Scope was initially developed, the railroad crossing was expected to require considerable coordination with the railroad company and, while achievable, was expected to be more complex than typical site development. If the County could obtain the railroad ROW, the crossing would be considerably less complicated and less costly. Because of the County's need to act

quickly in securing the property, a detailed review of railroad permitting and design procedures are not essential to decision making at this time.

7 DEVELOPMENT OPTIONS

Two possible options for reconditioning the East Parcel are presented below.

7.1 DEVELOPMENT OPTION 1 – RETURN TO ORIGINAL CONDITIONS

The remediation presented in this option is to return the site to the original grades less the amount of volume of the North DRA of approximately 210,000 cy on the East Parcel (13 acres x 10 feet deep), totaling an estimated 790,000 cy of clean backfill needed. For every 5 feet the North DRA can be made deeper, it saves approximately 100,000 cy of backfill. Clean soil excavated from the NW DRA is roughly estimated at 72,000 cy and could be used as a source of backfill. The NW DRA could be also expanded to provide for additional soil borrow. Excavation of the South DRA could provide an estimated 97,000 cy of clean soil (6 acres x 10 feet deep) of backfill. Also, the South DRA could be expanded for additional soil borrow. Soil will also be available from excavations on the Frontage Parcel for building construction and local stormwater management; however, the quantities of soil would be small by comparison.

The backfill material needs to be suitable/compatible to allow for future construction without the need for over excavation of unsuitable materials. One option for filling the deeper portions of the excavation is to import clean debris to backfill the lower elevations of the excavation. Clean debris is considered inert and is not regulated as a solid waste in accordance with FAC regulations listed below:

- Per Section 62-701.200(15), FAC, "*Clean debris" means any solid waste that is virtually inert, is not a pollution threat to ground water or surface waters, is not a fire hazard, and is likely to retain its physical and chemical structure under expected conditions of disposal or use. The term includes brick, glass, ceramics, and uncontaminated concrete including embedded pipe or steel.*
- Per Section 62-701.730(15), FAC, *Clean debris: Clean debris may be used as fill or raw material in any area, including waters of the State, subject to receipt of an environmental resource permit from the Department where applicable. Clean debris used as fill material is not solid waste, and such use does not require a solid waste permit under this rule.*

The County could accept clean debris for backfilling the excavation at a charge to the public. Clean debris should be placed in the deeper sections of the excavation and could extend to within 10 feet of the final surface grades depending on the actual material used. Backfill should be compacted in shallow lifts of 2 to 3 feet as it is placed to prevent future settlement from consolidation. Undisturbed natural ground is generally compacted to approximately 75 to 80 percent of the maximum dry density using American Society of Testing and Materials (ASTM) D698, standard test. Backfill below 10 feet of the final surface elevations should be compacted to 80 to 85 percent of the maximum dry density. Compaction in the upper 10 feet of backfill should be increased to 85 to 90 percent. In addition, backfill in the upper 10 feet should be select clean fill, with particle sizes not to

exceed 6 inches diameter in the lowest 5 feet and less than 2 inches diameter in the upper 5 feet.

7.2 Development Option 2

To avoid importing the total amount of fill needed to achieve the full restoration of the East Parcel, less the volume of the DRA, the site base grade elevation could be lowered to provide a better cut/fill balance. The idea is to terrace the East Parcel down in one or a series of incremental steps using shallow slopes (5:1) to a new base grade elevation 5 to 15 feet below natural grade. For every 5 feet the site is cut down over the 48 acres, approximately 380,000 cy of fill could be eliminated from site restoration.

In this option, the Frontage Parcel of 16 acres is not terraced and remains at the existing elevations but could be cut down a few feet to help balance the site. Every 1 foot of elevation excavated over 16 acres provides approximately 25,000 cy of soil. Clean soil excavated from the NW DRA is roughly estimated at 72,000 cy and could be used as a source of backfill. The NW DRA could be also expanded to provide for additional soil borrow. Excavation of the South DRA could provide an estimated 97,000 cy of clean soil (6 acres x 10 feet deep) of backfill. The South DRA could also be expanded for additional soil borrow.

This option would place most of the development on the East Parcel at a lower elevation than the surrounding public areas and help reduce the visual and noise impacts from routine operations. This would also help improve the effectiveness of buffers/plantings to screen the activities. One downside to this approach is that all stormwater falling on the site will need to be managed as stormwater as opposed to some amount of natural runoff and infiltration from undeveloped areas. However, this could be managed with a comprehensive stormwater management system, which will be required by local and state permits.

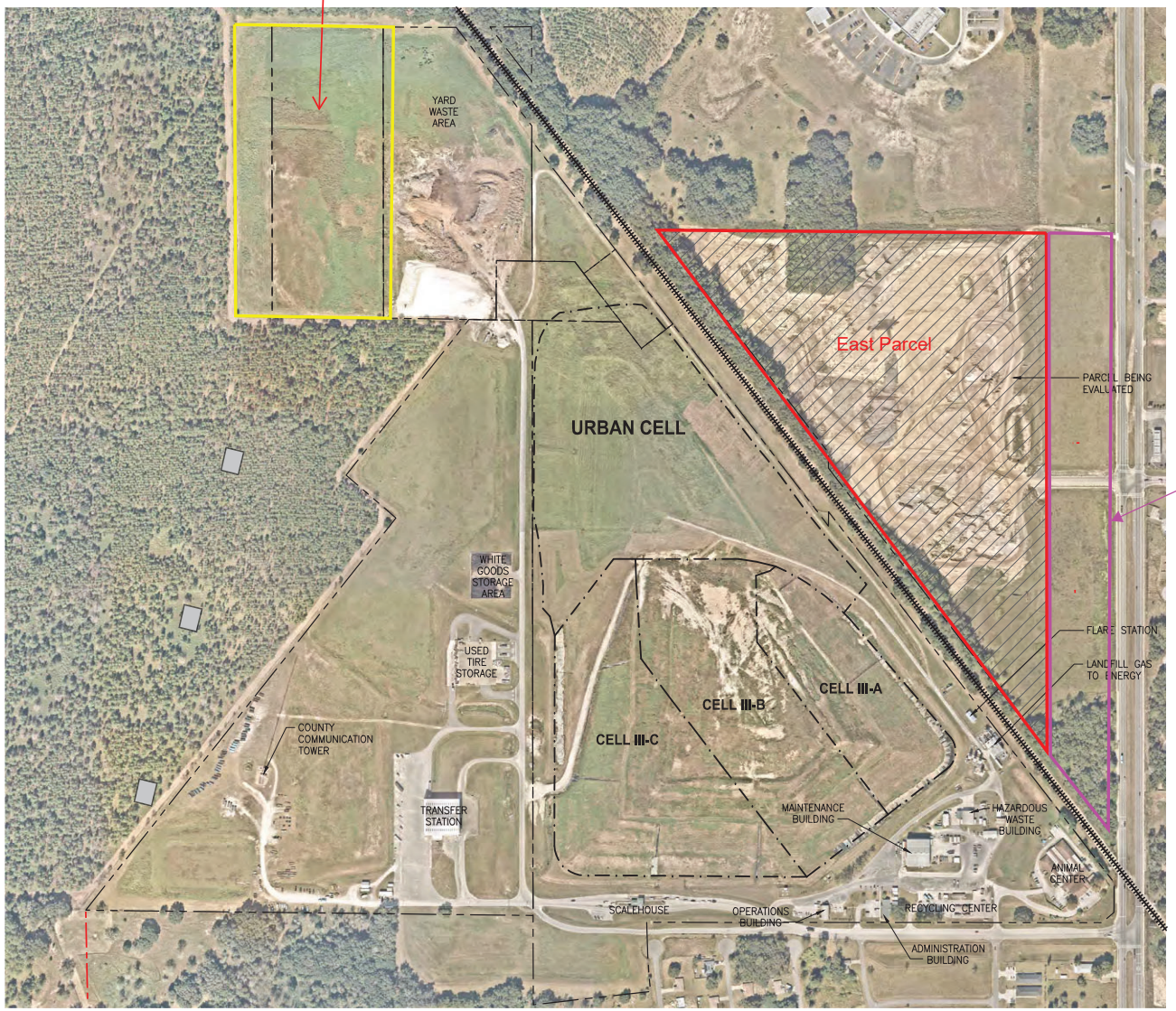
8 SUMMARY

Based on the results of this limited evaluation, the East Parcel appears to be suited for development of ancillary facilities for the Baseline Landfill and provide sufficient space to include these facilities:

- Relocating most of the ancillary/support facilities currently at the Baseline Landfill.
- Building the proposed new citizen recycling center.
- Reserving a portion of the road frontage for office or commercial use.
- Providing stormwater management including a portion of the runoff from Baseline.
- Creating an internal crossing to Baseline Landfill.

Challenges to using the East Parcel include:

- Balancing the cut/fill.
- Providing consistent backfill quality, compaction, and testing.
- Obtaining the railroad property or obtaining a crossing.
- Excavating the existing old dump site for the NW DRA.



N

GRAPHIC SCALE
0 125 250 500
SCALE IN FEET
1"=250'

LEGEND

LIMITS OF DISPOSAL CELLS
PROPERTY BOUNDARY
RAILROAD

Figure 1- Existing Conditions

AERIAL SOURCE NEARMAPS, DATED 10/27/2021

JonesEdmunds

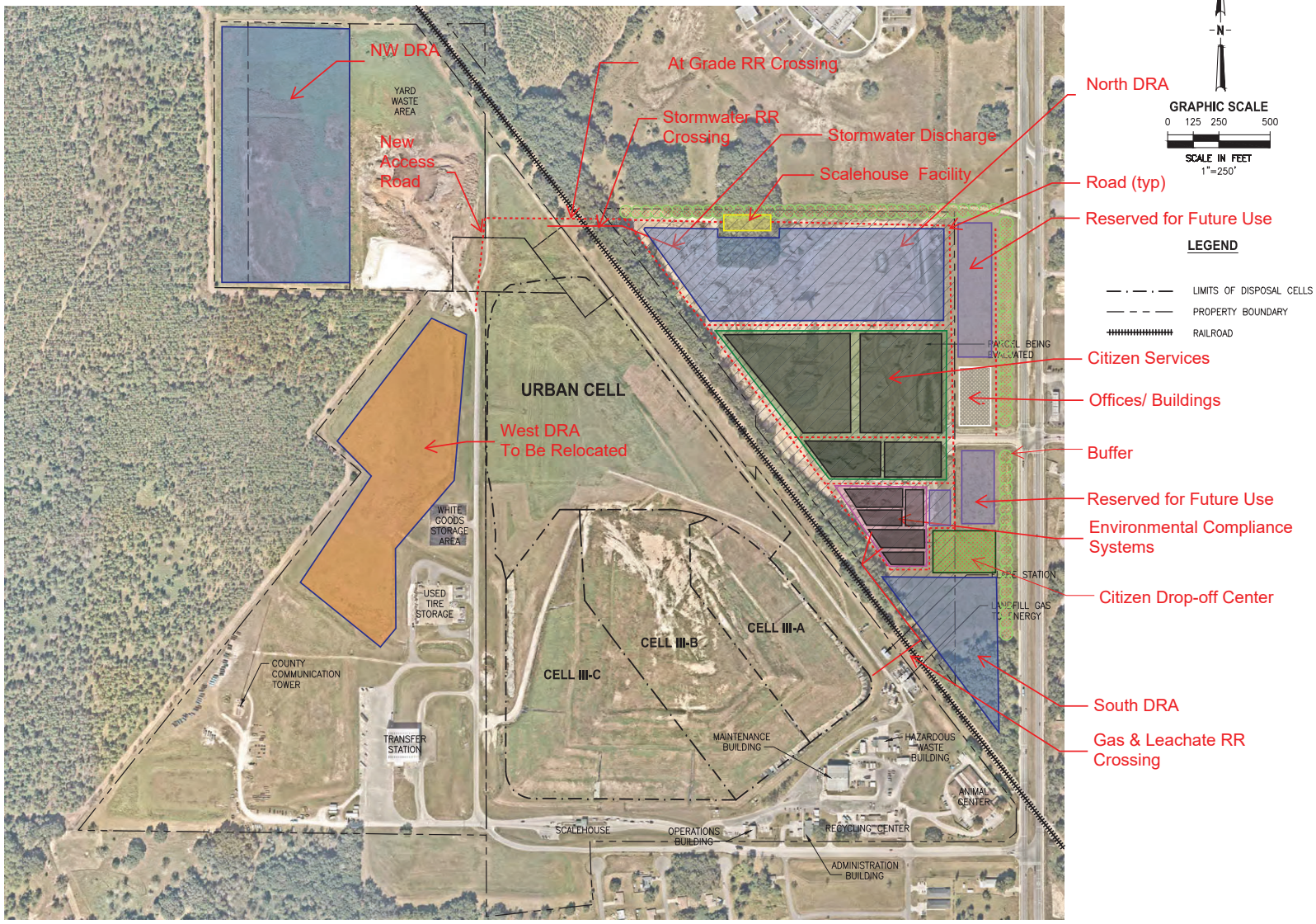


Figure 2- East and Frontage Parcel Development

AERIAL SOURCE NEARMAPS, DATED 10/27/2021

JonesEdmunds

Attachment 1

Soil Backfill Specifications

Attachment 1- Soil Backfill Specifications

Table 5.1. AASHTO Classification System

General Classification	*Granular materials (35% or less passing No. 200 Sieve (0.075 mm)*							*Silt-clay Materials More than 35% passing No. 200 Sieve (0.075 mm)*			
Group Classification	*A—1*		*A—3*	*A—2*				*A—4*	*A—5*	*A—6*	*A—7*
	A—1—a	*A—1—b*		*A—2—4*	*A—2—5*	*A—2—6*	*A—2—7*				*A—7—5 A—7—6*
(*a*) Sieve Analysis: Percent Passing											
(*i*) 2.00 mm (No. 10)	50 max										
(*ii*) 0.425 mm (No. 40)	30 max	50 max	51 min								
(*iii*) 0.075 mm (No. 200)	15 max	25 max	10 max	35 max	35 max	35 max	35 max	36 min	36 min	36 min	36 min
(*b*) Characteristics of fraction passing 0.425 mm (No. 40)											
(*i*) Liquid limit				40 max	41 min	40 max	41 min	40 max	41 min	40 max	41 min
(*ii*) Plasticity index	6 max		N.P.	10 max	10 max	11 min	11 min	10 max	10 max	11 min	11 min*
(*c*) Usual types of significant Constituent materials	Stone Fragments Gravel and sand		Fine Sand	Silty or Clayey Gravel Sand				Silty Soils		Clayey Soils	
(*d*) General rating as subgrade.	Excellent to Good							Fair to Poor			

* If plasticity index is equal to or less than (liquid Limit—30), the soil is A—7—5 (*i.e.* PL > 30%)
If plasticity index is greater than (Liquid Limit—30), the soil is A—7—6 (*i.e.* PL < 30%)

Attachment 2

Satellite Dump Investigation Report Update (Jones Edmunds, 2008)

SATELLITE DUMP
INVESTIGATION REPORT UPDATE
MARION COUNTY, FLORIDA

Prepared for:

MARION COUNTY BOARD OF COUNTY COMMISSIONERS
5601 SE 66th Street
Ocala, Florida 32671

Prepared by:

JONES EDMUNDS & ASSOCIATES, INC.
730 NE Waldo Road
Gainesville, Florida 32641

P.E. Certificate of Authorization #1841
P.G. Certificate of Authorization #133

May 2008

4.7 MARTEL LANDFILL

4.7.1 Location

Martel Landfill is located south of State Road 40, approximately 3 miles west of Interstate 75,[1] on Parcels 23203-001-00, 23306-001-00, and 23308-000-00, which are owned by Marion County.[6] The site is in Sections 17 and 18, Township 15 South, Range 21 East.[1] Figure 4-31 shows the site location, parcels, roads, structures, and other items of interest.

4.7.2 Historical Information

Waste disposal began at the site in 1962 on a 20-acre parcel in the southwest corner of the site. Waste from the surrounding areas was disposed of in trenches, where it was burned and buried. The 20-acre parcel was filled in 1971 and waste disposal began on the eastern part of the site. Waste buried at this part of the site was not burned. Waste disposal continued at this site until 1982.[1]

Contamination assessment activities, including groundwater monitoring, began at the site in 1990 and are currently ongoing.

The 1964 aerial photograph shows the location of the western disposal area. The 1972 aerial photograph shows both disposal areas.[3] The *Marion County Soil Survey* does not indicate the location of the landfill.[4] Historical aerial photographs and the soil survey are presented in Figures 4-32 through 4-35.

4.7.3 Visual Investigation

Jones Edmunds personnel observed the site on September 7, 2007. The Martel Landfill is closed and fenced. The northern portion of the site consists of the entrance road and recycling center operated by MCSWD. The waste disposal areas are covered in bahia grass that is periodically mowed. Adjacent land use includes a residential area to the south of the landfill site, with some dwellings within 50 feet of the boundary fence, pasture land to the north and west, a regional airport to the southeast of the site, and various forest/open lands to the east. The area is not served by a water utility[7] and residents are assumed to use private wells. Photos of the site are presented in Appendix G.

4.8 MCKAY DUMP

4.8.1 Location

The McKay Dump is located approximately 100 feet northwest of the Baseline Landfill, approximately ½ mile southwest of the intersection of SE Maricamp Road and SE 58th Ave, approximately 5 miles north of Belleview, Florida.[1] The site is on Parcels 35800-016-00 and 35800-017-00, which are owned by Marion County.[6] The site is in Section 1, Township 16

South, Range 22 East.[1] Figure 4-36 shows the site location, parcels, roads, structures, and other items of interest.

4.8.2 Historical Information

The site began receiving waste in the late 1950s and was operated by Marion County prison crews. Beginning in 1964 until it closed in 1969 the site was manned full-time by Marion County personnel. The site is approximately 15 acres and was completely filled when it was closed in 1969.[1]

The site is visible in the 1964 and 1972 aerial photographs.[3] The *Marion County Soil Survey* denotes the area as a "borrow pit."[4] Historical aerial photographs and the soil survey are presented in Figures 4-37 though 4-40.

Groundwater in the vicinity of the site is monitored semi-annually according to the groundwater monitoring plan in effect at Baseline Landfill.

4.8.3 Visual Investigation

Jones Edmunds personnel observed the site on November 27, 2007. The site is accessible through the Baseline Landfill and is currently used as a collection center for yard waste. Marion County residents deposit yard waste in the center of the site and MCSWD crew members operate a grinding machine on the eastern part of the site, turning the yard waste into mulch. The former disposal area is flat with low-lying shrubs. Along the western and northern boundary of the site are some large pine trees. Some large pieces of concrete are along the western boundary. Two groundwater monitoring wells are located along the northern boundary of the site. Pumps and wells are visible at residences south of the Baseline Landfill. Photos of the site are presented in Appendix H.

4.9 NEWTON LANDFILL

4.9.1 Location

The Newton Landfill is southwest of the intersection of US 441/301 and NW 100th Street, approximately 8 miles north of Ocala, Florida.[1] The site is on Parcel 12841-001-00, which is owned by Marion County.[5] The site is in Section 12, Township 14 South, Range 21 East.[1] Figure 4-41 shows the site location, parcels, roads, structures, and other items of interest.

4.9.2 Historical Information

The Newton Landfill received waste from Anthony, Lowell, Martin, Zuber, and surrounding areas from 1969 until 1979.[1]

* Waste may not be located throughout entire highlighted area nor confined to that area. Additional site investigation would be required to accurately depict disposal areas.

Site investigation performed in 2007. Aerial photograph taken 2004.

JONES EDMUNDS
ENGINEERS | ARCHITECTS | SCIENTISTS

Figure 4-36
McKay Dump
Site Information- 2007

0 300 600
Feet
1:7,200

N

13150_marion_county\113\mxd\Sat. Dump Inv. Rept\4-36_McKay_Site_Info2007.mxd CAS 2/6/2008

For Informational Purposes Only

Attachment 3

Geotechnical Report for the East Parcel (GeoTech, Inc., 2019)

GEO-TECH, INC.

ENGINEERING CONSULTANTS IN GEOTECHNICAL • ENVIRONMENTAL • CONSTRUCTION MATERIALS TESTING

August 21, 2019
Project No. 19-2878.94

David Tillman
Tillman and Associate Engineering, LLC
1720 SE 16th Ave; Bldg 100
Ocala Florida 34471

Reference: Baseline Sand Mine, Parcel No. 35800-008-00, SE 58th Avenue, Ocala, Florida
Soil Profiles, Proposed Sand Mine

Dear Mr. Tillman:

As requested, Geo-Technologies, Inc. (Geo-Tech) has performed a site exploration at the project site. Services were conducted in accordance with our Proposal No. 9880 dated July 8, 2019.

The following report summarizes our findings and evaluations. Generally accepted soils and foundation engineering practices were employed in the preparation of this report.

Geo-Tech appreciates the opportunity to provide our services for this project. Should you have any questions regarding the contents of this report or if we may be of further assistance, please do not hesitate to contact the undersigned.

Sincerely,

Gerald W. Green, Jr.
Soil & Water Scientist

GWG/CAH/ds

Craig A. Hampy, P.E.
Florida Registration No. 83240

Purposes of Exploration
Purposes of this study were to explore the subsurface conditions in the areas determined by the client and provide soil profiles, estimated seasonal high water table levels, depths to confining layers as well as determination of the base elevation by the client.

Site Description
The site is located at Parcel No. 35800-008-00 on the west side of SE 58th Avenue in Ocala, Florida. At the time of our site exploration, the site was covered with native trees and grasses.

Exploration Program
The geotechnical exploration program was performed on August 17, 2019 and consisted of the following:

- Eight (8) direct push soil borings to depths of approximately seventeen (17) to thirty-five (35) feet below existing site grade in areas determined by the client (ASTM D-6282).

Direct Push Sampling Description
The Direct Push (DP) soil sampling method (ASTM D-6282) consists of advancing a sampling device into subsurface soils by applying static pressure, by applying impacts, or by applying vibration, or any combination thereof, to the above ground portion of the sampler extensions until sampler has been advanced to the desired sampling depth. The sampler is recovered from the borehole and the sample removed from the sampler. The sampler is cleaned and the procedure repeated for the next desired sampling interval.

Sampling can be continuous for full depth borehole logging or incremental for specific interval sampling. Samplers used can be protected type for controlled specimen gathering or unprotected for general soil specimen collection. Direct push methods of soil sampling are used for geologic investigation, soil chemical composition studies, and water quality investigations. Continuous sampling is used to provide a lithological detail of the subsurface strata and to gather samples for classification and index.

Samples recovered during performance of our direct push borings were visually classified in the field and were transported to our laboratory for further analysis.

Findings
Boring locations and general subsurface conditions found in our soil borings are graphically presented on the soil profiles in Appendix I. Horizontal lines designating the interface between differing materials found represent approximate boundaries. Transition between soil layers is typically gradual.

Soils found in our soil boring SB-3 generally consisted of a surficial layer of fine sand approximately nine and one-half (9½) feet thick underlain by clayey sand, slightly sandy clay and limestone to the depths drilled.

Soils found in our soil borings SB-4 and SB-9 generally consisted of a surficial layer of fine sand ranging from approximately seven (7) to sixteen (16) feet thick underlain by slightly clayey sand to the depths drilled.

Soils found in our soil borings SB-5 and SB-10 generally consisted of a surficial layer of fine sand ranging from approximately four (4) to nine (9) feet thick underlain by slightly clayey sand, clayey sand and slightly sandy clay to the depths drilled.

Soils found in our soil boring SB-6 generally consisted of a surficial layer of fine sand approximately three (3) feet thick underlain by slightly clayey sand, clayey sand and limestone to the depths drilled.

Soils found in our soil boring SB-7 generally consisted of a surficial layer of fine sand approximately fourteen (14) feet thick underlain by slightly clayey sand, limestone and slightly sandy clay to the depths drilled.

Soils found in our soil boring SB-8 generally consisted of a surficial layer of fine sand approximately four and one-half (4½) feet thick underlain by slightly clayey sand and clayey sand to the depths drilled.

Ground water table levels were not found at our boring locations at the time of drilling.

Seasonal High Water Table Levels
Estimated seasonal high water table levels were found at depths ranging from approximately four and one-half (4½) feet below existing site grade top greater than depth pushed. Estimated seasonal high water table levels are indicated on the soil profiles at the appropriate depths.

Confining Layers
Confining layers were found at depths ranging from approximately eleven (11) feet below existing site grade to greater than depth pushed. Confining layers are indicated on the soil profiles at the appropriate depths.

Closure/General Qualifications
This report has been prepared in order to aid evaluation of the project site. The scope is limited to the specific project and the location described herein, and our description of the project represents our understanding of the significant aspects relevant to soil characteristics.

Analyses submitted in this report are based upon the data obtained from the soil borings performed at the locations indicated on the Boring Location Map, and from any other information discussed in this report. This report does not reflect any variations, which may occur between these borings. In the performance of subsurface investigations, specific information is obtained at specific locations at specific times. However, it is a well known fact that variations in soil and rock conditions exist on most sites between boring locations, and also such situations as groundwater levels vary from time to time. The nature and extent of variations may not become evident until the course of construction.

APPENDIX I

SOIL PROFILES

Log of Borehole: SB-3

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

GEO-TECH, INC.
ENGINEERING CONSULTANTS
1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–9		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	9.5	1	
10–11		**CLAYEY SAND** REDDISH BROWN CLAYEY SAND (SC)	11.0	2	ESHWTL AT APPROX. 11.0 FEET CONFINING LAYER AT APPROX. 11.0 FEET
12–17		**SLIGHTLY SANDY CLAY** LIGHT GRAY AND REDDISH BROWN SLIGHTLY SANDY CLAY (CH)	18.0	3	
18–20		**LIMESTONE** LIGHT BROWN LIMESTONE	20.0	4	
21–40		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019
Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-4

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL

Project No: 19-2878.94

Boring Location: (SEE SITE PLAN)

Engineer: NJH/DAC

Client: TILLMAN & ASSOCIATES ENGINEERING, LLC

Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
1–15		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	16.0	1	
16–25		**SLIGHTLY CLAYEY SAND** REDDISH BROWN SLIGHTLY CLAYEY SAND (SP-SC)	25.0	2	ESHWTL GREATER THAN DEPTH PUSHED CONFINING LAYER GREATER THAN DEPTH PUSHED
26–40		End of Borehole			

Ground Water Depth: NOT FOUND

Drill Date: AUGUST 17, 2019

Drilled By: WH/CC/RD

Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-5

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

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ENGINEERING CONSULTANTS
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Ocala, Florida
352.694.7711
WWW.GEOTECHFL.COM

Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	4.0	1	
4–9		**SLIGHTLY CLAYEY SAND** REDDISH BROWN SLIGHTLY CLAYEY SAND (SP-SC)	9.5	2	ESHWTL AT APPROX. 9.5 FEET
9–21		**CLAYEY SAND** LIGHT GRAY AND BROWN CLAYEY SAND (SC)	21.0	3	CONFINING LAYER AT APPROX. 21.0 FEET
21–35		**SLIGHTLY SANDY CLAY** LIGHT GREEN AND GRAY SLIGHTLY SANDY CLAY (CH) WITH LIMESTONE	35.0	4	
35		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019
Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-6

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL

Project No: 19-2878.94

Boring Location: (SEE SITE PLAN)

Engineer: NJH/DAC

Client: TILLMAN & ASSOCIATES ENGINEERING, LLC

Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–3		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	3.0	1	
3–4		**SLIGHTLY CLAYEY SAND** REDDISH BROWN SLIGHTLY CLAYEY SAND (SP-SC)	4.5	2	ESHWTL AT APPROX. 4.5 FEET
4–8		**CLAYEY SAND** LIGHT GRAY AND BROWN CLAYEY SAND (SC)	8.5	3	
8–13		**LIMESTONE** LIGHT BROWN LIMESTONE	13.0	4	
13–30		**LIMESTONE** LIGHT BROWN LIMESTONE WITH SEAMS OF LIGHT GREEN AND GRAY SLIGHTLY SANDY CLAY	30.0	5	
30		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED

Ground Water Depth: NOT FOUND

Drill Date: AUGUST 17, 2019

Drilled By: WH/CC/RD

Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-7

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–13		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	14.0	1	
14–20		**SLIGHTLY CLAYEY SAND** REDDISH BROWN SLIGHTLY CLAYEY SAND (SP-SC)	21.0	2	
21–22		**LIMESTONE** LIGHT BROWN LIMESTONE	23.0	3	ESHWTL AT APPROX. 23.0 FEET CONFINING LAYER AT APPROX. 23.0 FEET
23–34		**SLIGHTLY SANDY CLAY** LIGHT GRAY AND GREEN AND BROWN SLIGHTLY SANDY CLAY (CH) WITH LIMESTONE	35.0	4	
35		End of Borehole			

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019
Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-8

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94

Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC

Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–4		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	4.5	1	
5–20		**SLIGHTLY CLAYEY SAND** BROWN TO LIGHT BROWN SLIGHTLY CLAYEY SAND (SP-SC)	20.0	2	
21–25		**CLAYEY SAND** LIGHT BROWN AND REDDISH BROWN CLAYEY SAND (SC)	25.0	3	
26–40		End of Borehole			ESHWTL GREATER THAN DEPTH PUSHED CONFINING LAYER GREATER THAN DEPTH PUSHED

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019

Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-9

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

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Ocala, Florida
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Depth (ft)	Symbol	Description	Depth/Elev.	Number	Remarks
0		Ground Surface	0.0		
0–7		**FINE SAND** BROWN TO LIGHT BROWN FINE SAND (SP)	7.0	1	
7–25		**SLIGHTLY CLAYEY SAND** LIGHT BROWN AND GRAY SLIGHTLY CLAYEY SAND (SP-SC)	25.0	2	ESHWTL AT APPROX. 7.0 FEET
25		End of Borehole			CONFINING LAYER GREATER THAN DEPTH PUSHED

Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019
Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Log of Borehole: SB-10

Project: BASELINE SAND MINE, SE 58TH AVENUE, OCALA, FL
Project No: 19-2878.94
Boring Location: (SEE SITE PLAN)
Engineer: NJH/DAC
Client: TILLMAN & ASSOCIATES ENGINEERING, LLC
Enclosure: SITE PLAN

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1016 SE 3rd Avenue
Ocala, Florida
352.694.7711
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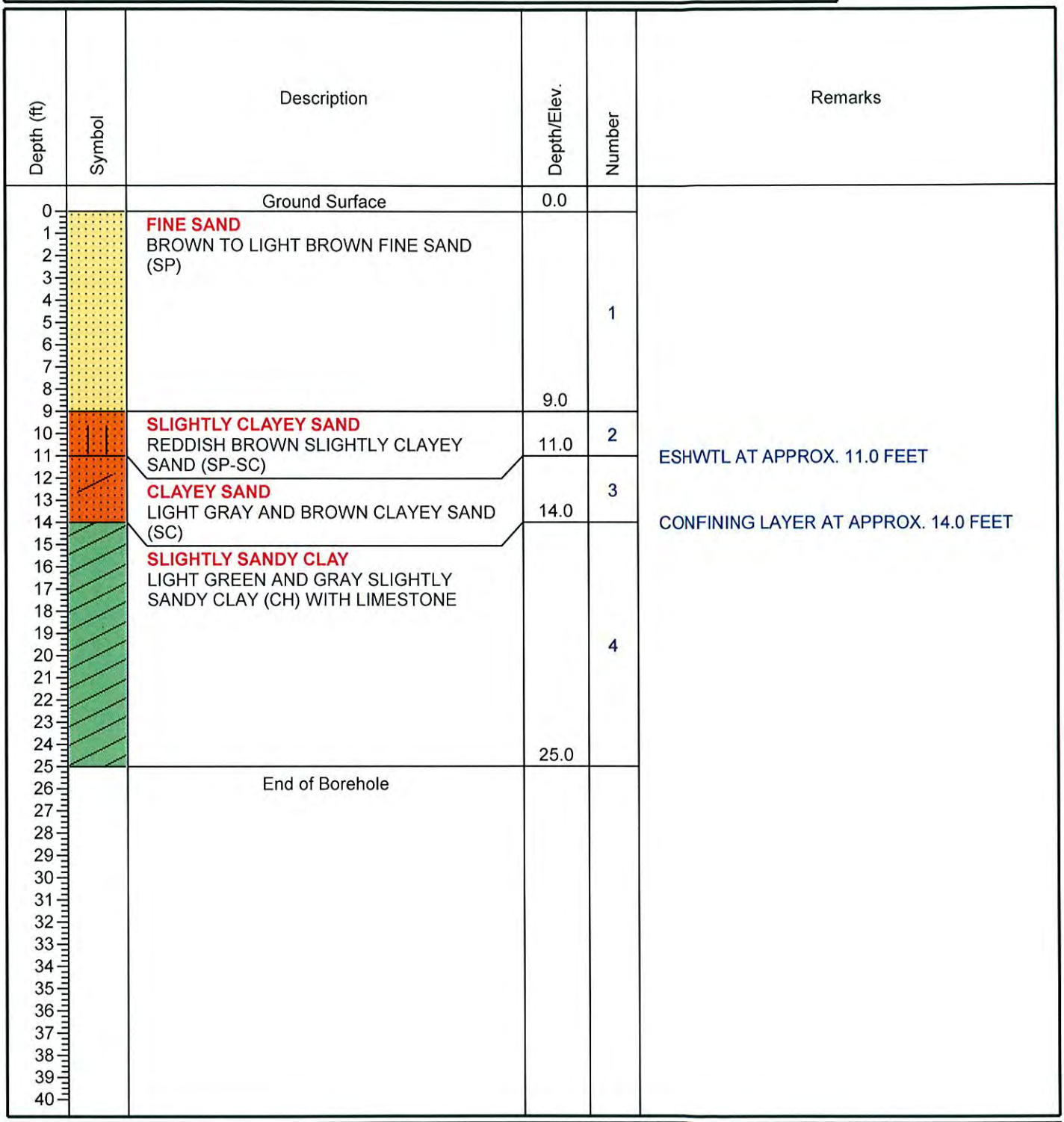


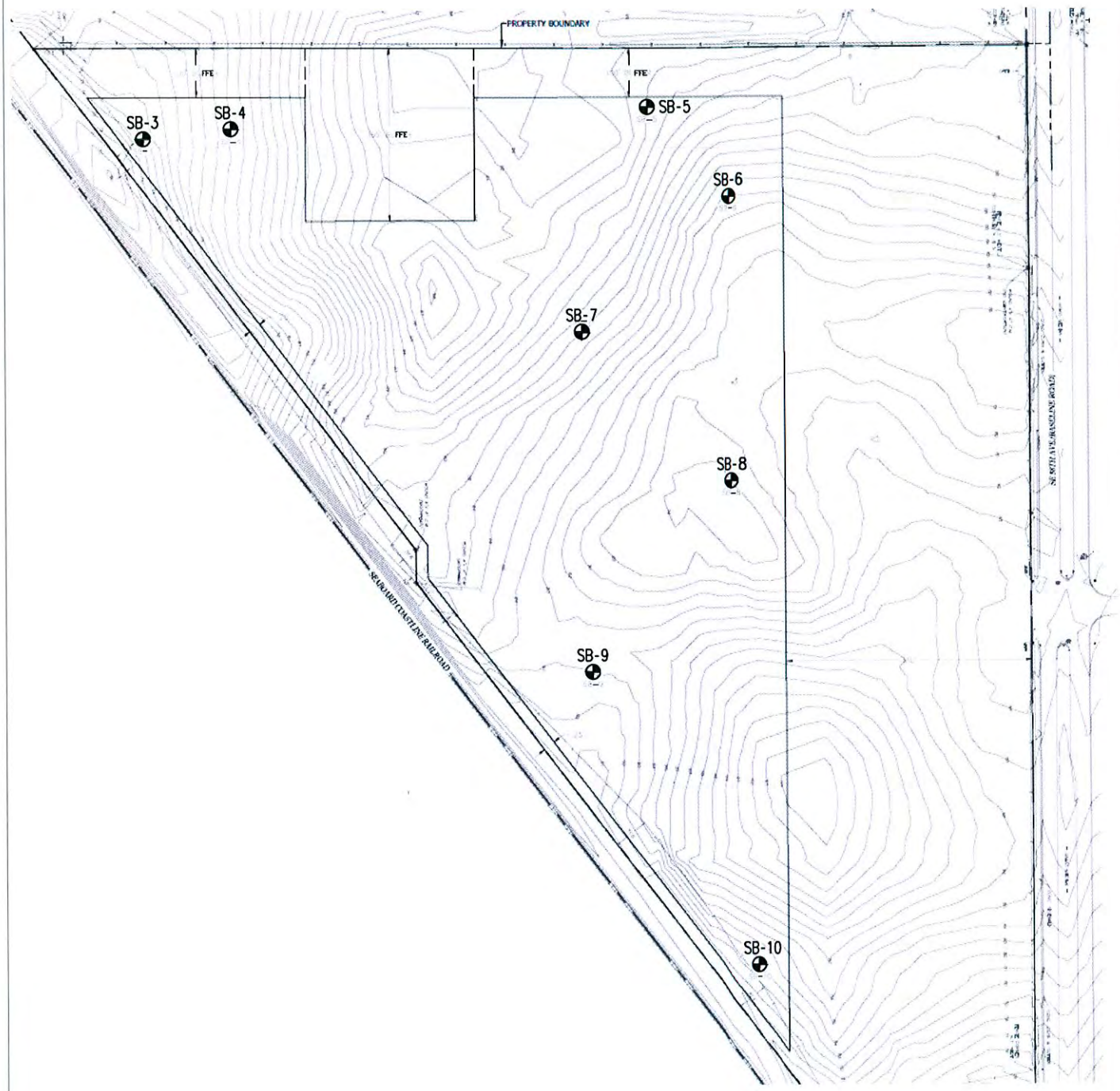
Ground Water Depth: NOT FOUND
Drill Date: AUGUST 17, 2019
Drilled By: WH/CC/RD
Drill Method: ASTM D-6282

Remarks: (SP) UNIFIED SOIL CLASSIFICATION SYMBOL AS DETERMINED BY VISUAL REVIEW

Soil Profile : 8 OF 8

APPENDIX II

BORING LOCATION MAP



⊕ = APPROXIMATE AUGER BORING LOCATION

TILLMAN AND ASSOCIATES ENGINEERING, LLC

BASELINE SAND MINE
PID NO. 35800-008-00, SE 58TH AVENUE
OCALA, FLORIDA

BORING LOCATION MAP

GEO-TECH, INC.
■GEOTECHNICAL ■ENVIRONMENTAL
■CONSTRUCTION MATERIALS TESTING ■GEOPHYSICAL EXPLORATION
1016 SE 3rd AVENUE, OCALA, FLORIDA 34471 ~ (352) 694-7711

PROJECT NO.	19-2878.94
SCALE:	N.T.S.
DATE:	8-21-19
FIGURE:	1

Appendix F

Out-of-County Disposal Cost Summary

JonesEdmunds

PROJECT NUMBER: 13150-293-01 SHEET 1 of 1
PROJECT NAME: Baseline Landfill Site Master Planning - Task Order 1
SUBJECT: Appendix F - Out-Of-County Disposal Cost Summary
BY: M.Deaderick DATE: 8/7/2024
CHECKED: M.Morse DATE: 8/7/2024

	Distance from Baseline Landfill (miles)	Off-Site Disposal Cost (per ton)[1]	Transportation Cost (per ton)	Transfer Station Operation Cost (per ton)	Total Out-of-County Disposal Cost
Heart of Florida	33	$29.00	$16.50	$11.81	$57.31
New River Solid Waste Authority[2]	79	$45.00	$39.50	$11.81	$96.31
Putnam County	59	$30.00	$29.50	$11.81	$71.31

Notes:
[1] Costs for Off-Site Disposal were collected by the Marion County Solid Waste Department.
[2] New River is not currently able to accept any more “out of region” waste at this time.